An Address
ON
THE HISTORY OF THE INVENTION AND DISCOVERY OF SPECTACLES.

Being the Inaugural Address delivered before the Members of the Bradford Division of the British Medical Association.

BY

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Science has been very lavish in the benefits she has conferred on mankind. A host of subjects occurs to one's mind in this relation: the steam engine, telescope, telegraph (in its various forms), telephone, microscope, etc., and, giving full consideration to each useful invention and discovery depending on the revelation of some hitherto hidden secret of Nature, none is of more importance than the observation that a biconvex lens apparently increases the size of the object viewed through it. On this observation rests the invention of a large number of optical instruments, including the spectacles or eyeglasses with which to-day we are so familiar.

Words fail me to give an adequate description, or to present to you any idea of the enormous benefit that has accrued to humanity from the use of spectacles. What should we do without them? When we consider that the emmetrope at 50 is no longer able to read ordinary print, nor to write at the usual distance, we are struck with the fact that all those above that age and in both sexes would be barred from the most useful and pleasure-giving functions and exercises of which their organisms are capable. What an enormous loss it would be to the world if every one at this age was put out of gear, so to speak, regarding reading and writing! This means something of still greater importance—namely, that without glasses a very large proportion of these people would be prevented from earning a living.

Our imagination might carry us into every grade of society and phase of life, and suggest to us not so much, perhaps, that the loss of this great boon would be a calamity as that we enjoy in its use one of the greatest, if not the very greatest, blessings that has ever been conferred on us by a mixture of empiricism and science.

I think you will agree with me—at least, I am hoping so—that anything that can affect not just you and me, not only this town and neighbouring towns, and not even whole countries, but the whole world—the entire human family—as spectacles do, a little time devoted to the study of their discovery will not be altogether without interest.

This inquiry can only be prosecuted regarding the people of the Western world, not those of the Far East, because it is quite possible the Chinese had the advantage in this, as in many other things, for we know that this interesting people had already reached a very high state of civilization in the early history of the world, and they may have used glasses long before we heard of them. To-day they use glasses which come from Europe, and are very much like those we use. It was different at the commencement of the nineteenth century. In 1817 Ferrario figured a group of Chinese in which a man is shown wearing glasses connected by a bridge and held in position by a string tied behind the ears. A similar picture is presented by Davis, in which a Chinaman is depicted wearing glasses held in position by weighted cords, which hang over the ears. Other travellers at that time relate that glasses were widely worn in China, the large round discs of which were made from a brownish stone, which the Chinese call "tea" stone, because it resembles in colour an infusion of the leaves of this plant. Among the drawings of a Chinese artist a female native is depicted wearing large round mounted glasses secured with a string which goes behind the ears, and attached to the bridge is a piece of bent wire having a spread-out end which serves as a support, resting on the forehead.

Two French writers have recently said that when Marco Ponlo penetrated China in 1270 the inhabitants were wearing lunettes. Horner says that the only people of antiquity who may have used spectacles are the Chinese, and Pansier too thinks this possible, but neither presents any evidence in support of his statement. Inquiries on the part of others show that there is no trace of evidence that the Chinese used glasses in the Middle Ages. As far as can be ascertained, there is nothing in the writings of the ancient Jews showing they had a knowledge of spectacles. We can say with certainty that the Greeks and Romans of antiquity knew nothing of the subject of this discourse—that is, of lenses with a long focus—as no author speaks of it, neither have excavations revealed anything of the kind. The great European collections contain nothing that can be referred to this class, but various references are made to lenses made of glass or rock crystal, which have been found in different places, such as Nola, Mayence, Pompeii, Nineveh, and in England—all convex; but, in the sense of spectacles, these lenses are out of the question, as they have too short a focus, and regarding their use we cannot get beyond conjecture; perhaps they served as magnifying and burning glasses.

Pliny and Seneca in places refer to the magnifying effect of a glass ball filled with water, like the well-known *Schusterkugel* of the Germans, by the aid of which the old cordwainers prosecuted their humble, though useful, calling. In this case the ancients attributed the magnifying effect of the ball to the water and not to the curved surface of the ball, and recognized the fact that with the help of such a device they were enabled to decipher small or indistinct writing. We cannot but be struck by the thought that the workers used some means of magnification when we reflect what small and fine work was done by the ancients in the art of precious stone cutting, some of the most beautiful work of antiquity still preserved; and it may be assumed that the extremely fine examples of Egyptian work in gold and precious stones, executed about 2000 B.C., could have been accomplished only with the aid of magnifying glasses. On this we can but hypothesize. There is ample evidence to show that biconvex lenses were used as burning glasses. Pliny tells us that glass balls filled with water were used by physicians for burning, and were to be bought from medicine dealers, and, perhaps, formed part of the armamentarium of the practitioner. What astonished them most in those days was that, in spite of the ball being full of cold water, it burnt.

The fact that Nero used an emerald when watching the gladiatorial contests would apparently end the contention that the ancients knew nothing of glasses. Tradition and narrative of varying origin have spread this belief widely, because Nero used this emerald.

The ancients were well acquainted with short sight, but there is no suggestion of a concave glass. Neither is there any indication of the manner in which Nero's emerald was ground, nor of the manner in which it was used—that is, whether he looked through it or at it. It would be useful and of some importance to learn something of the size of this stone, which must have been considerable, and in so far was exceptional, for at that time, though emeralds were plentiful in Rome (obtained from the Ural Mountains), they were mostly small, so it is not unlikely that Nero used the emerald otherwise than as a lens to aid his vision; and we must find some other reason for its use, which was probably this, that among the ancients the emerald had the reputation of being a means of strengthening the eye, for stonecutters were recommended to lay the stone they were cutting on an emerald or near it, and the fact that a green colour had an agreeable effect on the eye, which had been known from earliest times, appears to have been taken advantage of, and the Emperor's emerald may have been used as a real protective glass, which rendered his photophobia more easily tolerated. The green colour, on the other hand, may have been significant of the Emperor's political tendency, as the "party" openly manifested their partiality for the "greens" by wearing green dresses, strewing the floor with green sand, etc.

In the early Middle Ages we meet with the same difficulty in finding any trace of ground glasses with a long focus. We find even the same conditions prevailing at this time as obtained at the end of the early ages, which

need not excite our surprise, as the people of the early Christian era obtained their knowledge from the Greeks and Romans only. In old writings casual mention is made of magnifying glasses, but never of spectacles. Winfrid, the great Scot, called St. Boniface (A.D. 680–755), knew the effect of magnifying glasses, as also did the German poet Konrad, who died in 1287. The Arabian Alhazen, in the middle of the eleventh century, speaks of the magnification caused by a segment of a glass ball, and his commentator, Vitellio, was anxious to obtain such a glass to enable him to see small objects better. Roger Bacon, one of the most learned men of his day, was the first to make mention of glasses, in the year 1276. He remarks, in treating of the properties of glass lenses, of which he had a very valuable collection, "how useful they must be for those who are old and have weak sight."

About the year 1300 glasses were well known in Germany, as is expressly signified by the lyric poets of that time, and, according to von Humboldt, they were then extensively used in Flanders. Pansier says that pictorial representations of biblical characters wearing glasses were made in the middle of the fourteenth century. The majority of direct references to the invention of glasses are met with in Italian authors. Of the sons of that country two are credited with it. They were Salvino d'Amarto degli Armati and Alessandro della Spina. To the former the invention of glasses, in the year 1285, is attributed. He died in 1317. The Florentine antiquarian, Leopold del Migliore, discovered in a church in Florence an epitaph which ran as follows: "Here lies Salvino d'Armati of Florence, the inventor of spectacles. God forgive him his sins. Died in the year of our Lord 1317." Spina was a Dominican friar in the cloister of St. Catherine in Pisa. The archives of this monastery relate that he died in 1313, that he was a good man, of retiring disposition, who understood how to reproduce anything he saw, or of which he heard; he made glasses himself which were first made by some one who would not divulge the secret of their manufacture. With kind heart and willing hand he imparted what knowledge he had to his fellows. Giordano da Rivalto, a renowned preacher and divine of this same monastery, said after one of his sermons, preached on February 23rd, 1305: "It is barely twenty years since the art of making spectacles which enable us to see better was introduced, one of the most useful arts in the world. I have myself seen and spoken to the man who first made them." To whom he referred we do not know. This would give a date about 1280.

Dr. Franciscus Redi, physician and philosopher, writes to his friend Paul Falconeri, a Roman, in 1676, that he has an old manuscript dated 1299, which says in reference to correct writing and speaking, "I find myself so oppressed with years that without the glasses, known as spectacles, I have strength neither to read nor write. These have been lately invented for the conveniences of poor old people who are weak-sighted."

An account of the festivities in connexion with the marriage of the Duchess Juta of Austria with Count Ludwig von Oettingen states that a guest, Pietro Buonaparte, ambassador to the Austrian Court, caused great excitement by appearing with glasses, called "beryls," across his nose, invented by the Florentine, Salvino degli Armati.

That glasses were invented at the end of the thirteenth century in Italy is abundantly shown by the great majority of contributors to the history of this subject, and either by Armati and Spina together or independently of each other. We read, however, that at the same time in Germany old people were using them, as they were also in Flanders. Other accounts agree in the statement that the same thing was going on in countries far removed from each other.

The references to Armati and Spina are so numerous that they have forced other traditions into the background, the chief of which declares that Roger Bacon was the discoverer. Caesamaker decides in favour of the learned Oxford monk, and there is much to be said for him when we take into consideration the general history, the things that were known, and the few who took interest in them. Heinrich Goethals, a close friend of Bacon, may have been entrusted with the secret of the invention and use of glasses and of Bacon's studies with magnifying glasses. He was commissioned to go to Rome to advocate a matter relating to his Order before Pope Martin IV. On his journey through Italy he heard the Pope was dead (A.D. 1285), and in order that the journey should not be made in vain he remained in Florence until a new Pope was chosen. Here he got to know Spina (the man who could reproduce anything of which he heard), who, from what Bacon's friend told him, it is said, made spectacles, so that Spina may have got his inspiration indirectly from Bacon. The sad fate which overtook the intelligent Oxford Franciscan explains why his name was not mentioned in this matter. Though in scientific knowledge by far excelling his contemporaries, his invention was looked on as a sort of witchcraft, or as the work of the very devil himself. His name was of bad repute in Italy, as he frequently and emphatically reprehended the corrupt morals of the clergy. He was finally overcome by his enemies, for, after writing one of his letters to the Pope they threw him into prison, where he languished until within a short time of his death.

The first medical man to mention glasses was Bernard Gordon, educated at Salerno, and professor in Montpellier. He said that they were not necessary, thanks to his remedies for eye complaints, which so excelled that they made those whose sight was failing able to read small print without the use of glasses. Guy de Chauliac, body physician to Popes Clement VI, Innocent VI, and Urban V, also lauded his own eye lotion, but added: "If this doesn't relieve you, then try eyeglasses."

No one at this time knew anything at all about the refraction of light, hence the senseless talk about the various remedies. The laws of optics, relating to glass lenses, have been known only since the time of Maurolycus (A.D. 1494–1575) and the immortal Kepler (A.D. 1571–1630). The physician who first ordered glasses in a professional capacity was one Montanus, a teacher in Padua. He ordered protecting glasses, reading glasses, and, some say, prisms. Physicians at this time evinced great hostility to the wearing of glasses, and owing to the way in which they dissuaded the people from their use, it was not to be expected that it would spread very rapidly. The chief among these was Georg Bartisch, of Königsbrück, near Dresden, the author of the first German book on ophthalmology. Even into the nineteenth century they considered it beneath their dignity to order proper glasses for anybody, and left it to dealers, who, even in our time, surround the testing for glasses with a mysterious air. It was only in the middle of the nineteenth century that fixed printed testing types were obtainable by ophthalmic surgeons. Until the laws of optics were discovered which was long after spectacles came into use, these were considered things of mystery; people attributed a secret power to lenses by the aid of which they could read and write. Franz de Paula (died A.D. 1507) declared that his lost vision was quite restored by the use of glasses. Theophrastus Paracelsus, the wonderful chemist and doctor, who spoiled an otherwise worthy reputation by "crying in the markets," speaks of an *ars berillistica*, and considered spectacles a consecrated crystal in which one could see the events of the future. In the year 1551 Record related that Roger Bacon had ground a glass in which he could verily see the devil at play.

It is not difficult to explain why our knowledge of the advent of spectacles is so spare and deficient. About the time at which the events of which we have spoken were taking place, the methods of communicating them to successors were very few and primitive, the only means at disposal being writing on either parchment or stone. The latter has at least preserved the name of the inventor of spectacles.

There were comparatively few of the costly manuscripts at the time when the art of writing and illuminating them was first practised, and only a few have resisted the destruction caused by the unrelenting hand of time, and thus have been preserved. In a sketch of the Council of Constance by Richtenthal in the library of Prague University, the Chancellor is represented with glasses clipped on his nose (A.D. 1417), while in part of the same manuscript preserved in the library of the Royal Academy of Arts in St. Petersburg none is seen wearing glasses, though it abounds in figures. Paintings may be considered important sources of information. We do not possess many pictures executed in the early days of the

spectacle era, and the artist, whatever his imagination might be, would never have sullied his reputation by introducing subjects wearing glasses. In some degree this was different in the fifteenth century, when great artists produced great works rich in figures, when the reproduction of drawings by copper engravings or woodcuts began, and when the art of printing in unparalleled triumph transformed the whole life of mankind.

To the caricaturist our subject presents a rich field, and many express by their productions the use and form of glasses. These are also useful in giving us the period of the production of the picture—not that of the subject. In the same way, according to the choice of the painter who thought fit to dress his biblical characters in costumes of the Middle Ages, so also we find in such pictures people wearing glasses. Examples of this are seen in the "Adultress" by Kranach, and in "The Widow's Mite" by Titian in the Louvre; an old Jew is seen in each wearing glasses. Although the number of such pictures is considerable, yet it is relatively small considering the enormous number of pictures in which we seek in vain for any subject wearing glasses. This is particularly the case with pictures in which numbers of individuals of different standing are represented. Not only in miniatures of divines, philosophers, and others, but in wall and panel paintings, especially taking at random such paintings as those of Paul Veronese in Venice, Raphael's Stanzas in Rome, "Triumph of Death" in Pisa, wall paintings of Pinturrichio in the library of Siena, and pictures of the Netherlands of the seventeenth and eighteenth centuries, and in many others representing hundreds of pictures and thousands of people, yet not one wearing glasses, while other things, such as tobacco pipes, are in strong evidence. The same may be said of bodies of divines, physicians and learned men in general. In single representations of men of various callings we see their various insignia, but no trace of spectacles. In representations of the audiences of theatres not a single individual is seen wearing glasses. A comparison of these with similar representations of the nineteenth century shows a different condition of things, for we regularly see people represented wearing glasses. The medical man is nearly always so represented in order to distinguish him from others. There is also another great difference between the periods. In former centuries few people used glasses at all, still fewer wore them; this difference is all the more marked when we consider that the eyes of mankind, with the exception of some increase in myopia, have not changed. There must have been some cause or causes at work which prevented the general adoption of glasses as an aid to vision. As a matter of fact, such causes did obtain; not only did doctors themselves refrain from wearing them, but they distinctly dissuaded the people from doing so. From lack of means of quick locomotion in the Middle Ages and early modern times a long period was required for glasses to become known to a wide circle, and, as I have said, they were looked on as a kind of magic toy until such time as the laws governing the action of lenses on light were known. Still other causes may be adduced. It must be remembered that life in the old days seldom rendered it necessary to use glasses, as few people followed any calling which demanded acute vision. Watchmakers, workers in gold, engravers, doctors, men of letters, and teachers were not so frequently met with as nowadays. Even members of such bodies were but seldom depicted wearing glasses, whereas with the physician the urine glass never failed. Those who had not good vision avoided such occupations as required it. The world was not quite so well filled as it is to-day. The choice of occupation and the obtaining of a livelihood were not so difficult, and we know that among the monks those only were entrusted with the execution of manuscripts to whom writing and painting presented no difficulties. History relates that monks suffered from cramp in the arms and hands from prolonged writing, but there is no mention of difficulty in seeing; Witkerb, Abbot of Tours (tenth century), renowned for the wonderful manuscripts he produced, wrote his last one in his 90th year. Neither did the invention of printing, which brought the reading of books to a wide circle, tend to the increased use of glasses, for then the books were so large that they were carried on a stand, and the thick letters could be deciphered without difficulty. The number of those who wore glasses relatively to those who actually required them was still lessened by want of training and the inferior social position of the women of that period. Women and girls who at that time were able to read and write with facility formed such remarkable exceptions that those who possessed that faculty were considered to be highly accomplished. Pictures showing women wearing glasses are extremely rare, and not one has been seen showing children wearing them, and all men shown wearing glasses have the mark of advanced age.

We need not wonder that in early times men were strongly opposed to this custom, as at first glasses were ill-shaped and most disagreeably striking in appearance, and, more than this, they directed the attention to a physical disability.

Patients wearing glasses were made fun of, and not altogether in a very tender manner. On the title-page of a satire on a tailor, published in the sixteenth century, two goats are represented standing erect on hind legs, the one on the left wearing glasses, and at the same time ejecting the contents of the lower part of his digestive apparatus. In the year 1494 a caricature of a bibliomaniac was published by Sebastian Brandt, representing that individual wearing a very ungainly pair of nose nippers. In a series of caricatures published in 1715 a dwarf is depicted in clown's dress executing a somersault, and on the buttocks, which part is directed to the spectators, is sketched a pair of glasses. Many other examples of the caricaturist's art executed at this period are extant, and are evidently intended to show to what ridicule people were subject who availed themselves of this valuable aid to vision. The shadow of this ridicule accompanied the wearing of glasses for a long time, even unto the nineteenth century. Thus does valuable knowledge travel slowly.

Their prohibitive costliness rendered the wide adoption of spectacles impossible. At the end of the sixteenth century the price per pair, expressed in terms of present-day value, was from £10 to £20. From this circumstance glasses which frequently had costly ornamental fittings were seldom seen, and then in the possession of wealthy people only. They were enumerated among the possessions of the owner, and in testamentary dispositions were particularly mentioned—for example, in 1372, in the will of King John of France and in that of Charles V of France, and also in a list of belongings of St. Antonine, Archbishop of Florence (died 1446). They could not always be obtained, even for large amounts of money. The Elector of Saxony in 1570, then in his 48th year, just about the time when his presbyopia and latent hypermetropia, if he had any, where rapidly becoming manifest, sent his servant to Augsburg to get him a pair, which, however, he could not there obtain; he was obliged to go to Venice, where he accomplished his mission. Lenses, too, were made in very few places, and the art of preparing them was very jealously guarded as a valuable secret. This secret was held until the sixteenth century, when it was lost, as was that of the manufacture of artificial eyes, through treachery, and the secret quickly spread to other lands. Venice for a long time was the only place where good glasses were made. The factories were placed at some distance from the town in order to avoid the danger of fire; even here, though the home of the manufacture of this valuable article, it found no favour, probably because the highly developed sense of the beautiful in the Venetians resented such a menace to their pleasing exterior. Treatises on arts and manufactures of the eighteenth century give a prominent place to the making of glasses for spectacles, and, as far as we are able to gather, Germany was the chief country which produced them. The places selected were those that had made themselves famous for industry—namely, Nuremberg, Regensburg, and Augsburg. In France spectacle-makers were included in the Reflector and Toy-makers' Guild, and were mentioned in a new statute granted by Henry III in 1581. This order, or company as we call it to-day, possessed its own heraldic emblem, whereon is figured a mirror between two pairs of eyeglasses. For the production of lenses fine Venetian glass as well as flint and crown glass was used. When we read that the raw material was provided by the beryl, we must not forget that under this name to-day many kinds of precious stones are included, from the dull or transparent

and variably coloured crystals to the more costly variety, the aquamarine, and the mostly prized of all, the emerald. In the Middle Ages every transparent stone, even glass, was named "beryl," and there is no reason for doubting that lenses were ground from beryl—not the finer varieties, but from those of a less attractive virtue. Such crystals have been found in England and France, having a length of 1 to 2 metres, weighing 1,500 kilos, and chiefly grey or brown in colour. This recalls the topaz used by the Chinese, which has great variety in colour and markings. About the middle of the nineteenth century the most preferred and at the same time—as is usually the case—the most expensive glasses were made from Brazilian rock crystal, the "pebble" of to-day, which is characterized by its peculiar clearness and hardness. In 1591 a maker prepared glasses from amber saturated in linseed oil, which made the amber transparent and colourless. These were probably used as protectors, as were discs of mica used later. The lenses were not always round; some were oval, others square or even octagonal. At first—and probably with Armati—the lenses had figures scratched on them, indicating the age of the individual for whom they were considered most suitable—a quite arbitrary notation, which in the most favourable case rested on very small experience; this method was given up, but on what ground is unknown. The designation of lenses according to their focal length was generally adopted about the middle of the nineteenth century. In the second half of the eighteenth century they were graduated according to their focal length in inches, and even then each maker had his own method of differentiation. A long time elapsed before glasses were made comfortable for wear. Perhaps a reference to pictorial representation will do more than I can say to give you some idea of the evolution of the spectacle frame. The oldest form is the reading glass for old people (it still survives), round, and mounted in metal rim with long handle; this continued in general use until the nineteenth century. The lenses were large and thick and the rim not unusually made from one of the precious metals and highly ornamented; many of these had protecting cases, which were used as handles; these single glasses were used by every nation in Europe. During the time of the first French Empire the use of these glasses was associated with a certain amount of foppishness and coxcombry, and it was the fashion with men, as well as with women, to swing in an elegant manner a large glass with a handle, and to put it before the eye (chiefly the left) from time to time, as though observing persons and things in earnest, but it was impudence more than anything else; such glasses were very often simply plain glass, the possessor being neither myopic nor hypermetropic. The history of the monocle I have not been able to trace. From this single glass, frames with two lenses evolved at the end of the fifteenth century. Each glass had a support, and these were fastened together at the end, or were bound together with an overlapping joint, and sometimes furnished with a protecting case. This form went out of fashion later, and was reintroduced at the end of the first French Revolution, partly as a useful instrument and partly by the fops. At the commencement of the fifteenth century we find the glasses connected with each other by a very thick bar or bridge, the forerunner of the later adopted pince-nez, but still not so constructed as to sit or grip the nose firmly.

Savonarola in one of his sermons advised those who wore glasses to attach them to the peak of the cap, which latter should be well pushed down on the head, a method that survived a long time, but it was never popular. Glasses at this time were mounted in heavy frames of wood or leather, and maintained in position by means of a cord tied behind the ears. Later, mountings were of gold, silver, steel, fishbones, and variously coloured horn. These were provided with side pieces for holding them in position, mostly of metal, but so thick and clumsy that the whole thing looked like the production of a village blacksmith; this obtained until the end of the eighteenth century, when the much lighter constructed sides made their appearance. Such as we see nowadays were not made until the Thirties of last century. The cumbrous nose-riders, then so-called, soon made way for those provided with springs, and the clumsiness was relieved somewhat by various perforations of the coloured horn mountings. The spring arrangement preceded by some time the adoption of a joint between the two glasses (shown in one of the pictures), which was adapted to a better fit by allowing the glasses to grip the nose. The springs were of different form and size. To make them at all certain of retaining their position on the nose was reserved for later times, for well into the eighteenth century all eyeglasses fitted very badly and so uncertainly that they must either be kept in position by hand or pushed forward into the fold between the cheek and nose; this continued until the nineteenth century. The precursor of the metal spring was one made from horn or fishbone, shown in one of the photographs. The use of the string or cord commenced with the nineteenth century. At the end of the fifteenth century various ornamentations were added to or cut in the frames among the better class of people, consistent with the greater care exercised in dress characteristic of this period—hearts, crowns, trefoils, acorns, and human faces. These were exceptions, as already said, the cumbrous form prevailing well into comparatively recent times. The weight of the glasses was chiefly accounted for by the size and thickness of the lenses, as they were mostly of short focus. A picture by Watteau, painted a little time before his death (A.D. 1720), gives the first representation of the long-handled lorgnette as we see it to-day.

Glasses were sold chiefly by pedlars, mostly Jews, who occupied themselves also with grinding the lenses. These hawkers must have aroused some interest and curiosity, as they became the subject of numerous pictures, of which you see one or two copies. These dealers carried their wares from place to place so long as there were no resident eye doctors, the only representative of the ophthalmic surgeon being the cataract coucher, such as is seen to-day in the Balkans and in India. These wanderers made glasses one of their most fertile sources of income; they gave themselves pompous sounding names, pretending to be real eye doctors, selling expensive glasses, not only for near and distant vision, but for the cure of diseases of the eye; and many of these gentry recommended glasses for reading to those who had not learnt that art. They were also sold in respectable shops in Germany, and at the beginning of the seventeenth century legal protection was extended to the manufacturers.

The makers of glasses were mostly skilled in other fine work, such as carving in ivory, bone, and wood. The shops of respectable dealers were made known by signs such as we see to-day, but of a more primitive character, as shown in the pictures.

The lenses referred to in the foregoing remarks have been of the convex kind. The history of the development and use of the concave lens is very different from that of the convex variety; it came on the scene much later. There is no mention whatever of concave glasses by the ancients, though short-sightedness was well known, not as an error of refraction, but as a weakness of the eye. Theophrastus relates that the tyrant Dionysius (460 B.C.) was short-sighted, and his courtiers flattered him by feigning a similar affliction. Aristotle discusses the cause of blinking and the small writing of the myope. From some remarks of Pliny we may conclude that short sight was not uncommon even in his day. The well-known Arabian physician, Avicenna (A.D. 980–1037), the learned Dominican, Albertus Magnus (A.D. 1193–1280), and other authors from the twelfth to the seventeenth centuries relate that not only was short-sightedness well known, but that in Italy it was very common, a circumstance most likely having connexion with the great number of students and the high rate of civilization and advanced education in that country. This myopia engaged the attention of many learned men. Cardanus (A.D. 1501–1576), mathematician, philosopher, and physician in Pavia, made the mind and disposition of the myopic the subject of dissertation without having the slightest idea of the nature and cause of the condition. Roger Bacon was the first to mention concave glasses (A.D. 1276), but it was not until the end of the sixteenth century that we find the first clear description, and that was given by John, Archbishop of Canterbury, in the year 1593. Porta also described the effect of concave glasses on short sight. The optical nature of myopia, as said before, was first discussed by Kepler, and some time after Zahn, in the year 1685, first

described the grinding of concave lenses. Compared with convex lenses, a much longer time elapsed before they came into general use, as there were many more obstacles in the way of progress for this than for the reading glass. The life of that day did not lend itself to the desire or even necessity of improved vision for distance. The houses were compressed within small space, streets were narrow and dark, and the people were little inclined for the open; the short-sighted instinctively avoided occupations and pleasures demanding good vision for distant objects, such as the military and hunting, though Leo X was an exception to this, for he hunted with a concave glass, and in spite of his myopia is said to have seen better than his companions; a picture by Raphael, painted A.D. 1517, corroborates what history says, as he is represented sitting between his two cardinals holding a single glass, which is evidently concave. He has the typical appearance of a myope.

So that we can assume with a fair degree of certainty that concave glasses came into use about the middle of the sixteenth century. Stilling found in a book on duelling (A.D. 1551) rules laid down for the short-sighted, so that they should not stand at a disadvantage when engaging with one whose vision was normal. We also find that helmets for myopes were used in war. Specially made appliances were attached to the visor with small slits through which the short-sighted wearer could look. It is a well known fact that myopes can see better through small holes, as the peripheral rays of the cone of light are cut off. In Dante's time glass protectors were used in the visor to keep the dust from the eyes of the warrior. Had concave glasses been known at this time they would in all likelihood have been put into the helmets of the short-sighted, but there is no evidence of this. By the eighteenth century concave glasses were widely used, and it was then understood that the lorgnette had reference to glasses for distant vision only.

It was remarked by numerous observers that many were affected with weak eyes who were neither long nor short sighted, and who were not at all benefited by concave or convex glasses. It was reserved for Thomas Young to clear up this question, which he explained as being due to an abnormal curvature of the cornea, to which the name of astigmatism was given. It was while at Göttingen that Young made his first communication on this subject, which was soon followed by others from different observers. It was, however, a long time before anything was done in the way of relieving the symptoms produced by this condition, and, as you well know, cylindrical lenses, either concave or convex, according to the error of refraction, were discovered to be the only help. Cassas the painter recognized his own astigmatism in 1818, but not until 1844 did Suscipi, the Roman optician, succeed in fitting him with suitable glasses. Goodrich, a divine, was fitted by the optician McAlister in Philadelphia in 1828 with a concave cylinder. Airey of Cambridge described the astigmatism of his own eyes, which was corrected by Fuller of Ipswich. Goode also discovered the same condition in himself, and Chamblant in Paris gave him the correcting glass. To-day it is the daily duty of every ophthalmic surgeon, and should form part of his work, to estimate and give the proper glass for astigmatism, which can be done easily, thanks to the appliances available. Periscopic lenses are of somewhat ancient date. They were recommended as the objective of the telescope in 1660. At the end of the eighteenth century Smith advised their use along with spectacle lenses, but it was Wollaston, in 1804, who introduced them into practice under the name by which they are now known. Made first by the English optician Dollond, they were introduced into France in 1813. Achromatic lenses were first made for spectacles by Charles Chevalier in the middle of last century, and, according to Desmarres, it was he who was also the first to recommend the use of prisms, about the year 1844, "as a great help in the treatment of squint." Hyperbolic glasses made their appearance in 1879 at the Ophthalmological Congress in Heidelberg. Rählman of Dorpat recommended them for conical cornea and irregular astigmatism. The lenses were 4 cm. in diameter and the cone had a depth of ½ to 2 mm.

Protective glasses came into use at the end of the seventeenth century. Ambroise Paré recommended those who had been operated on for cataract to wear green glasses. They were unpopular, as certain peculiarities were supposed to attach to individuals who wore them, such as moroseness, unsociability, and depression of spirits, a connexion not altogether avoidable at the present day.

Prejudice against the use of glasses still exists. However daintily made, many people will not wear them unless in practical solitude, and still more will not be seen outside wearing them, though, happily, these are in the minority. Such prejudices die hard, and I think we have practically escaped from the thraldom that held us, and the public are now convinced that the wearing of proper glasses can be counted as nothing but a benefit to those for whom they are intended.

I thought of devoting a few minutes to the consideration of the value of this discovery to the public. It can be stated definitely that it was given to the world quite independently of the medical profession; in fact, had the advice of medical men been taken, the time of general adoption of glasses as an aid to vision might have been considerably postponed; but this can be said, that it was left for the medical profession to put the estimation and treatment of errors of refraction on a strictly scientific basis. Donders made a name which will abide so long as ophthalmology is practised, and Helmholtz, accredited also with the discovery of the ophthalmoscope, gave physiological optics such a strictly mathematically scientific foundation that few of us can follow him in his abstractions.

The ampler my experience becomes, the more I am convinced that the only person who should correct the vision of the ametropic is a well-qualified, experienced ophthalmic surgeon. As well as the various anomalies of refraction, he must be able to detect and treat the several disturbances of the ocular muscles, one of the most difficult branches of ophthalmology. The varieties of heterophoria are numerous and their treatment often exceedingly difficult, especially hyperphoria, and it is in such cases that prisms act as a veritable charm, and render a life comfortable which before relief was obtained was nothing but continual misery. Beside the knowledge necessary to correct a simple error of refraction, it is very important to be able to distinguish between the various forms of squint, concomitant and paralytic, congenital word-blindness, congenital cataract, and many other conditions; and last, but greatest of all, to be able to interpret correctly the appearances of the fundus oculi as revealed by the ophthalmoscope.

My opinion is that any one attempting the prescribing of glasses who is ignorant of these points, and is unable to use the ophthalmoscope, courts disaster, is doing a great injustice to himself, and a still greater injustice and perhaps permanent injury to his patient.

It is to the everlasting credit and honour of our profession that we are the last to endeavour to put a value on our own art, charitably practised; I mean, to calculate what the value of it may be to the recipient. I rather think we err too much in this direction, and that on occasion the public should be reminded to what extent they really are indebted to us, especially those who get hospital treatment.

During the last seventeen years, that is the time I have been connected with the Royal Eye and Ear Hospital at Bradford, something like 35,000 pairs of spectacles have been prescribed by the staff. What real value in cash has that been to those benefited? It is always a difficult thing to appraise the value of medical work; at most we can only approximate. Taking the average duration of life of these 35,000 patients at ten years, which is extremely low, and much more likely to be far below the mark than otherwise, this would give 350,000 years distributed among the 35,000 people. What would be the average gain per head resultant on wearing glasses? Would £20 per annum be too high? I think not, considering that a large number over 50 could not earn a living at all without glasses; but take it at half that, and you will get a result which will surprise all those who have not considered this question before—namely, that within the last seventeen years the wage-earning capacity of this neighbourhood has been increased by no less a sum than £3,500,000, and this advantage has been conferred on the community by the staff of the Royal Eye and Ear Hospital by the prescribing of glasses only.

Sir Jonathan Hutchinson, in speaking publicly on this subject a few years ago*—that is, the value of ophthalmic science—claimed that the saving to the community by the operations done for senile cataract alone at the Royal London Ophthalmic Hospital was no less than £104,000 per annum. This amount would be reduced to *nil*—nothing—if the patients were not able to get suitable glasses.

These figures are, if anything, too low an estimate, and when the increased comfort and pleasure the wearers enjoy is added to other advantages it may be justly allowed that few greater benefits have been conferred on mankind than the invention of spectacles.

(The pictures referred to in the text—a series of artistic prints from various sources, illustrating points referred to by the speaker—were passed round the audience during the address.)

AUTHORS CONSULTED.

Horner: *Ueber Brillen aus alter und neuer Zeit*, 1885.
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Beck: *Die Brille und ihre Geschichte*, 1903.
Du Bois-Reymond: *Zur Geschichte der Glaslinsen*, 1905.
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THE INFLUENCE OF TIME ON RED GLASS.

By C. H. WÜRTZEN, M.D.

(From the Medical Department of the Øresundshospital, Copenhagen.)

In an earlier publication[1] attention was drawn to the fact that it must be supposed that the power of absorbing the chemical rays of light ceases in the course of time in the case of ordinary red—that is, not diffused glass coloured all through, even if it is kept in the dark when not in use.

In accordance with this it was pointed out that it was necessary to examine every single glass immediately before use, and not to remain satisfied with former examinations, still less when the glass held up to the light still appears beautifully red and unchanged. On the other hand, not knowing the age of every single red pane, nor whether it was spectroscopically examined when received, nor how long it had been in use, it was impossible on the basis of existing material to say how long or how short a time the red glass might have kept its efficiency, or anything about the further conditions under which it might be lost. Herein lie a few questions whose practical importance we cannot disregard, and I shall therefore set forth what we have been able to learn in this regard from a series of periodical examinations of the department's stock of red panes.

In January, 1909, this stock consisted of 45 panes. At the end of March of the same year we bought 12 new ones, which were faultless when tested. Our stock was thus increased to 56, as one of the old ones was lost. Since then no new panes have been procured.

Result of the Spectroscopical Examinations.

In each column is indicated the number of the glass which has proved to be pervious to (1) only red and orange rays, (2) also to yellow and slightly green, and finally (3) to almost all rays.

	Red and Orange Rays.	Yellow and Slightly Green.	Almost All Rays.
January 25th, 1909 ...	24	8	13 = 45
March 21st, 1910... ...	26	12	18 = 56
April 7th, 1911	27	9	20 = 56
March 6th, 1912	20	11	25 = 56

The reason why the classification embraces no more than these three groups is that the object of the examinations was only to distinguish between usable and unusable glass. The usable glass comprises both the first groups, as presumably it is of no importance whether the yellow and a few green rays pass, but it is necessary to understand that the question only turns on small quantities of green, and therefore the examinations to mark the boundary between the second and the third group have been very exact.

On the other hand, the limit between the two "usable" groups of one set may appear somewhat fluctuating, considering the variation of the mutual proportion in size between these which has been found at the different examinations. But even if, in a way, it may be said that the limit appears fluctuating, this fact does not rest on any difficulty of acknowledgement nor on any defect in the spectroscopical examination in itself. We must suppose that it is connected with the fact that the strength of the light, although the examinations have always been done in sunny days and the spectroscope has always been pointed directly at the sun, has varied somewhat in intensity at the different times—a circumstance whose influence cannot be avoided, unless a constant artificial source of light is at disposal. The figures in the last column give a fairly certain affirmation of what hitherto could only be a supposition—namely, that the red glass gradually loses its power of retaining the chemical rays of the light. The verification of this point has undoubtedly a certain value, but we still have to find out when and how the change takes place.

As the glass is kept in the dark, and it has therefore been under similar conditions and under circumstances which apparently gave the colour only a slight and rather equal chance for fading, one would naturally anticipate that this change would take place equally and gradually in the course of a certain number of years. On examining the table, it is seen that a movement of this type takes place. The number for 1912 is not taken into account in this connexion, as the panes bought in 1909 all proved to be faultless till 1911 inclusive, and therefore the trace and the equal course of the movement are shown in the graduated series 13-18-20. Thus the number of panes which for this reason have to be renewed yearly is not very considerable, but must be taken into consideration, as the appearance of variola is so rare in our country.

However, the red glass is not weakened exclusively by this late age change; long before this claims its quota of the panes which for a long time have shown themselves resistant other panes are already far advanced towards unfitness. The 12 panes, for instance, bought in 1909 have quickly lost their power of resistance. As already mentioned, they were found to be quite satisfactory when examined in 1910 and in 1911, as some of them were used during a very short period during 1911 in the treatment of some patients attacked by measles; examination on March 6th, 1912, gave quite another result, only 4 remaining quite insensible to time; 2 allowed red, orange, yellow, and slightly green rays to pass through, while 6 let all rays pass.

In order to find out whether it may be supposed that it was this quite short influence of light, or perhaps rather the long preservation which had affected the panes, all the last bought panes were left unprotected on a lawn for about ten days, many of them being fine sunny days, after which they were submitted to a renewed examination. This gave the same result as mentioned above, and consequently the light had no temporarily deleterious influence on the panes found faultless at the last examination but one, nor had it produced any further deterioration of the two belonging to Group II.

These observations show sufficiently clearly that the deterioration may take place rather quickly, and they indicate also that the glass quickly fails completely when first it has begun to fail—that is, is no longer able to absorb that part of the spectrum which lies in the beginning of the green.

The fact that the spectroscopical examination of all glass together—old as well as new—has always shown that as soon as the first green stripe is distinctly visible all the rest of the spectrum is visible at the same time, points in the same direction. At all single examinations there has been only a single exception. This exception showed us that all rays passed to the beginning of the blue; but of this part of the spectrum it was chiefly the transition itself which was visible. This phenomenon explains why the separation of the groups could take place in practice without difficulty.

*Special report of the Mansion House meeting in support of the Royal London Ophthalmic Hospital, February 1st, 1897.

I have still to remark that red glass, when it has long lost its power of retaining the chemical rays, will appear suspicious to the naked eye too. In this case the red colour fades and turns yellow. The yellowing generally begins as wavy streaks, sometimes as islands, and is no doubt an infallible sign that the glass is quite unusable even with respect to those parts where nothing is yet to be seen by the naked eye.

I can therefore only repeat that an examination with the naked eye is no examination at all, or, to be more precise, when founded on such an examination we only can prove unusableness, but judge nothing about usableness.

Before concluding I must mention that when procuring red glass we unfortunately have no means of securing ourselves against getting a product which comparatively soon loses its applicability, as for reasons of economy we are compelled to take an article of which only the surface is coloured.

If, therefore, it happens that we are rather often exposed to a bad purchase, this circumstance must have a restraining influence on the Finsen treatment of small-pox by this method of application. But this unsurpassed and ideal treatment cannot be attacked for this reason, and the carrying out of the treatment by red panes has in some respects such advantages over the other methods in which it can be arranged that it is well worth some expense.

REFERENCE.
[1] Treatment of Small-pox in Red Light and in the Dark, BRITISH MEDICAL JOURNAL, August 6th, 1910.

THE OPERATION FOR INDUCING ARTIFICIAL PNEUMOTHORAX.

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THE great Continental authorities on artificial pneumothorax are Forlanini and Saugman for the puncture method, and for the incision method Lucius Spengler, Brauer, and Neumann. In England most work has probably been done by Dr. Lillingston and Dr. Vere Pearson. I have witnessed the operation at Dr. Jane Walker's sanatorium at Naylands, have seen Dr. Vere Pearson at work, and have discussed the subject with Dr. Lillingston; abroad I have seen the work of Dr. Lucius Spengler and of Dr. Neumann at the Schatzalp Sanatorium, Davos. The following notes give instructions for the puncture method. I have tried both this and the incision method, and I prefer the puncture. Both have their dangers, and it has been said that the adherents of each have counted the slain of the other; but after reading the treatise by Brauer and Lucius Spengler,[1] I see no reason to agree with their strenuous and emphatic condemnation of primary punctures, and in the following remarks this method alone is described in detail.

1. A few hours before the operation care should be taken to place the patient in such a position that sputum may as far as possible be got rid of.

2. Half an hour before the operation an injection of ⅓ grain morph. hydrochlor. is given. I see no objection to the use of scopolamine as an alternative, but I have not myself used it. The site of operation (the posterior axillary border of the sixth interspace, or another point, according to the necessities of the case) is to be carefully prepared by shaving, if needed, scrubbing with antiseptic, washing with saline, and painting with iodine. Care must be taken to have the nitrogen properly warmed. By means of a hot-water jacket the temperature within the nitrogen jar can be raised and maintained at approximately the normal temperature of the body.

3. At the end of the half-hour, ½ grain novocain or cocaine is to be injected into the superficial tissues, and a similar quantity two minutes later into the deeper tissues. Adrenalin is associated with each of these drugs; 5 drops of a 1 in 1,000 solution (Parke, Davis, and Co.) may be given in all, half the quantity with each injection. Novocain is said to be safer, and personally I prefer it.

4. Place the patient in position on the bed or couch; let him lie on the side, turning over a little as if to lie on his face, thus bringing the site of operation uppermost. A pillow, such as Moynihan uses in certain abdominal operations, should be placed underneath, so as to arch the side of the chest, and thus to widen the intercostal spaces; and the arm of the side to be operated on should be raised and bent round the head. A flatter surface is obtained if the patient is seated and bending forward, with the hands extended between the knees and crossed in front, as in the older manner of handcuffing; but this position does not separate the ribs so well, and it is more trying for the patient.

5. The needle, which has been kept sterile in alcohol, is attached to its tube and is slowly introduced. The communication between the needle and the manometer is opened by manipulation of the three-way cock, all other passages being kept closed. The moment the needle trespasses in the slightest degree on the pleural space there is oscillation of the water level in the manometer, owing to the fact that the needle has penetrated a space in which the pressure is negative—that is, there is a suction tendency towards the lung from the manometer.

6. As soon as it is evident, from this oscillation, that the needle is in the pleural cavity, a further test must be made in order to see whether a vein has been punctured; for if at any time a vein is punctured or torn, there is danger of gas being allowed to enter the circulation. To test for this danger apply a well-fitting hypodermic syringe nozzle to a sideway passage in the needle, this sideway passage being guarded, when not in use, by a plug. If blood can be aspirated into the hypodermic syringe, the needle must be withdrawn and a fresh puncture made.

7. If there is no aspiration of blood, manipulate the three-way cock so as to allow nitrogen to enter. (Some use air instead of nitrogen, and even oxygen, for the first puncture, these gases being more soluble in blood and less likely to cause embolism.) The patient should be advised not to breathe deeply, and the manometer should be carefully watched, so that the nitrogen may only be allowed to pass in slowly. A suitable amount to be introduced at a first puncture is 300 c.cm.; on subsequent refills it may be as much as 1,000 c.cm., the usual quantity being 750 c.cm.

8. The patient, if doing well, becomes slightly blue and sweaty; the pulse remains fairly regular, but may quicken a little. During a first operation, however, there may be signs of faintness; pallor, gasping distress and intermittency of the pulse call for immediate stimulation. Five drops of liq. strych., given hypodermically, is one of the best of stimulants. The supply of nitrogen may, if necessary, be interrupted for a while, or, if so much has been allowed to enter that a refill may be made safely, the operation may be stopped altogether.

9. When sufficient nitrogen has entered the pleural cavity the needle is withdrawn and the opening is sealed with collodion. No other dressing is necessary.

10. The patient must of course be kept in bed for a day after the first operation; this direction must be strictly enforced. But after several refills toleration is established, and the patient need only lie down on a couch for two hours, after which he may get up and walk about.

11. The gas is generally absorbed in the course of a week; a refill is therefore necessary as a rule in three days. Brauer and Lucius Spengler sometimes proceed to the refill on the day following the first operation, and so does Saugman. A refill is a simple matter, as there is now a real cavity, and not, as in the first instance, a potential one. After three or more refills have been made, gas ceases to be readily absorbed, and the refill may be made every fortnight, or even every month, according to the indication afforded by the physical signs.

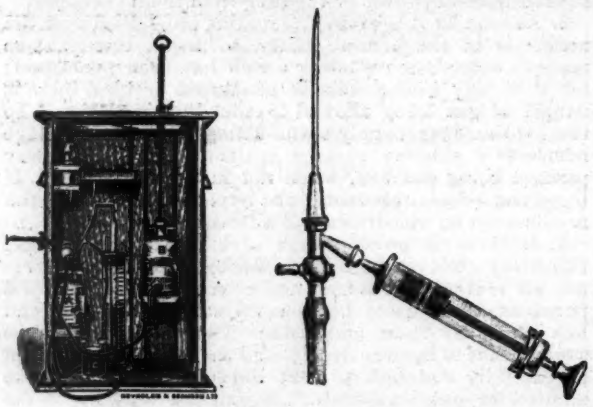
12. One minor result of the operation I have found to be the relief of that constant pleuritic pain which is more than occasionally met with in cases of phthisis. The major result is to compress the diseased lung into small compass, thus lessening the area of ulceration and absorption.

13. The presence of adhesions does not negative the operation, though it may lessen its usefulness. The common *x*-ray picture is a cavity filled with air and subtended by a bridge of adhesions. In some cases the gas

has to be introduced at more than one point, because the adhesions divide the cavity of the pleura into two or more chambers. Of course, the ideal patient for the induction of artificial pneumothorax is one who has unilateral disease without any excess of pleuritic adhesions.

14. Death has occurred from pleural reflex, the stimulus being reflected through the pneumogastric nerve to the heart. This is obviated by the narcotics administered before and at the time of the operation, and also by the warming of the nitrogen, a precaution on which Brauer and Lucius Spengler lay great stress, though they do not suggest a method for carrying it out. Death has also occurred from gas embolism. This is guarded against by observing the suction test for blood. I have known rapid oedema of the lung to follow the operation, which is thus limited; it should not be performed when there is marked emphysema or any of those conditions which are associated with cyanosis and marked dilatation of the right side of the heart.

The apparatus which I use, made by Messrs. Reynolds and Branson, Ltd., of Leeds, seems to offer some improvement on the older instruments which I have seen used by



other workers. It is simple, well made, accurate, and clean. The nitrogen is generated from the air as required, by means of a pyrogallate solution. It can be warmed by filling with hot water the bottle into which it is to pass; to maintain the heat a hot water jacket may be used. It is an additional precaution against sepsis to fill this bottle with a solution of hydrarg. perchlor. 1 in 5,000. The manometer is so constructed that it acts as a safety valve, allowing no greater pressure than 10 in. of water. It permits of direct communication with the patient, not merely through the nitrogen jar, so that the actual pressure within the pleura can from time to time be controlled—a point of great importance, emphasized by Saugman as well as by Brauer and Lucius Spengler.* Brauer has "found it useful during refills, in doubtful cases, to scent the nitrogen strongly, so that the breath of the patient might furnish an indication as to whether or not the needle had entered the lung." Vere Pearson, in making the same suggestion, refers to the sensation of the patient. Where the primary puncture method is used this precaution may well be taken always, and not merely for refills in doubtful cases. A little peppermint may be put for this purpose on cotton-wool in one end of the tube leading from the nitrogen flask to the patient. A short sterile glass tube close to the needle should contain a plug of sterile cotton-wool. The depth to which the needle enters during primary puncture should always be noted, for guidance of the operator during subsequent refills.

Dr. Neumann, of Davos, who demonstrated the incision method before Dr. Nathan Raw and myself, dissects down to the pleura, cutting through the fascia and separating the intercostal muscles with a blunt instrument in the direction of their fibres. Having exposed the costal pleura, which is recognized by its white fibrous appearance, he punctures it, still using the blunt needle. The obvious danger of this method is sepsis, an accident which can be avoided by sufficient care. The dissection is not repeated for a refill, the puncture method being used instead. I have myself induced artificial pneumothorax by incision, but so far my impression is in favour of the primary puncture method. The operator will find the dissection on the cadaver much more simple than on the living patient. For me it is not so much a question of deciding as to the better method of inducing artificial pneumothorax as of deciding whether that or thoracoplastic is to be preferred, especially as the latter operation can now be done by experts with lightning rapidity and without a general anaesthetic.

* Saugman, who obtains his nitrogen from iron bombs under pressure, whence it is transferred to a glass cylinder, suggests that the gas should be allowed to flow through the needle before it is inserted, until there is an equilibrium of pressure between the nitrogen in the cylinder and the atmosphere. This is not necessary when the nitrogen is generated by the method to which I have referred.

REFERENCE.

[1] *Die Technik des künstlichen Pneumothorax.*

A CASE OF INFLUENZAL MENINGITIS.

BY

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WHILE it would be incorrect to describe influenzal meningitis as a rarity, at the same time instances of this affection are sufficiently uncommon to deserve being placed on record from their clinical, therapeutical, and bacteriological interest.*

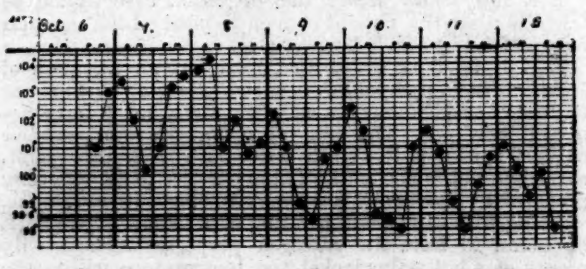
Batten,[1] in 1910, brought the literature up to date by publishing 14 cases of Langer, Douglas, Dudgeon and Adams,[5] and others, with the addition of 5 cases which he had observed himself. At the same time, he reviewed 26 cases which Cohoe had published. In the same year Ritchie[3] published 3 more instances, and Douglas[2] 1, In 1911 Sayce[4] gave 7 examples, in which, however, the organism isolated presented some deviation from the type originally described by Pfeiffer. Considering, therefore, that the influenzal organism is a definite cause of meningitis, we venture to publish the following case as a further contribution to the literature:

The patient, a male child of 13 months, was admitted to the East London Hospital for Children on October 6th, 1912.

The history was that he had been a strong, healthy child till a month previously, when he had whooping-cough. The acute attack had passed off, but he had been left with a troublesome cough, and was said to twitch at times, and have some difficulty in getting his breath. On the evening of admission he had suddenly started "fitting," and was brought up within half an hour of onset.

On admission he was very rigid and had marked retraction. The head was held twisted to the left as well as retracted. The eyes were staring and directed to the left. Knee-jerks were present; Babinski extensor and Kernig's sign obtained. There was some impairment of the note at both bases and tubular breathing at left base. Many crepitations of bronchial character scattered over the rest of the chest. The examination of heart, abdomen, throat, and ears revealed nothing abnormal.

On October 7th rigidity was a little less and the child could swallow, but during the night it had had to be fed by nasal tube. Spinal fluid was withdrawn, 10 c.cm.; it was under increased pressure and turbid. It contained albumin, 85 per cent. of polymorphs, and a short bacillus.



On October 8th stiffness and head retraction more marked, and the child moaned continuously. Signs of pneumonia were more definite, and more widespread on the left side. Lumbar puncture was again performed, and, after withdrawing 10 c.cm.

* J. G. Forbes, in the *Quarterly Journal of Medicine*, 1908, p. 109, published the results of the examination of cerebro-spinal fluid in 140 cases with cerebral symptoms treated at Great Ormond Street Children's Hospital. Of these, 109 were various forms of meningitis, 57 being tuberculous, 36 meningococcal, 9 pneumococcal, 5 streptococcal, 1 staphylococcal, and 1 due to the *B. coli*. In no case was the *B. influenzae* the causal organism.

of fluid, the thecal space was washed out with sterilized normal saline solution until the fluid draining away was clear. This spinal lavage was repeated on October 9th, 10th, and 11th, and urotropin gr. iij was given every six hours; but, although the temperature seemed to be coming down gradually and the fluid becoming clearer each day, on the evening of October 12th the child died.

The Cerebro-spinal Fluid.

Lumbar puncture was performed five times, and a total of about 55 c.cm. of turbid cerebro-spinal fluid was obtained. Centrifuged film preparations stained by carbol-thionin consisted almost entirely of polymorphonuclear leucocytes and numerous small, slender bacilli. Most of the organisms were free, but a good proportion of them were intracellular. The bacilli were Gram-negative, and a differential count gave polymorphonuclears 86 per cent., mononuclears 14 per cent.

Cultural Characteristics of the Organisms.—A good growth, consisting of discrete, fine, translucent colonies, was obtained on blood agar at 37° C. in forty-eight hours. The term "dew-drops," used by some authors, is a good description of the appearance of these colonies. In broth no growth could be obtained anaërobically, and none on agar or gelatine at 22° C. There was no action on litmus lactose, maltose, mannite, cane sugar, or dextrose. On cultivation some longer forms of the bacilli were noted. Pure cultures were obtained on blood agar in every instance.

At the necropsy cultures were taken from the fluid in the descending cornu of the right lateral ventricle. The influenza bacillus was recovered in pure culture. Further investigation showed that the cultural characters of this organism agreed with those of the bacillus obtained during life from the cerebro-spinal fluid.

Film preparations made *post mortem* from the purulent exudate revealed polymorphonuclear cells and a few small bacilli, which were mainly extracellular.

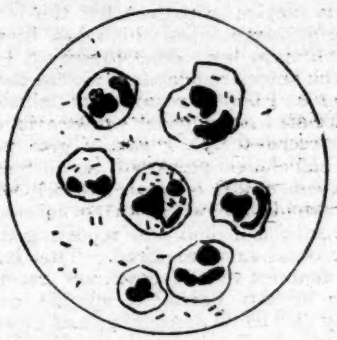


Fig. 1.—Showing the polymorphonuclear leucocytes with bacilli both inside and outside the cells. Ocular No. 6; Zeiss objective 1/12. Drawn under the camera lucida. Stained by carbol thionin blue.

Post-mortem Report.

Brain.—The entire ventricular system showed dilatation, and was filled with turbid cerebro-spinal fluid.

Spinal Cord.—No evidence of involvement of the membranes.

Meninges.—Thick yellowish pus occupied the interpeduncular space and covered the superior and anterior surfaces of the frontal lobes. The anterior poles of both temporo-sphenoidal lobes were capped by the purulent exudate, which was also distributed in random scattered patches over other portions of the cranial vertex. The pus was odourless and the vessels of the brain and meninges were intensely injected.

Heart normal.

Cranial bones and *middle ears* normal.

Lungs.—Right lung was oedematous and congested. In the left lung an area of confluent bronchopneumonia occupied the lower lobe and the lower half of the upper lobe. Excised portions sank in water. A creamy layer of adhesions was found on the pleura covering the left lower lobe. There was no free pus in the pleural cavity. A section of the lung showed microscopically a layer of fibrin forming a network on the pleura, and having some round cells entangled in its meshes. The pleura deep to this showed a band of dense white fibrous tissue containing numerous fibroblasts and thin-walled blood vessels. There was marked round-celled infiltration of the walls of the smaller bronchi, and desquamation of epithelial cells into their lumina. The alveolar walls were congested, and the alveoli themselves were filled with cells principally of the epithelioid and plasma varieties, but among these was a certain number of polymorphonuclear leucocytes.

Trachea and oesophagus were normal. Bronchial glands congested, but not enlarged. The liver, spleen, kidneys, all normal except for a little cloudy swelling. The stomach, intestines, peritoneum, mesenteric glands were all normal.

Various writers have met with some differences in the morphology of this organism. Although in direct film preparations from the fluid only small short bacilli within the limits of 1.5 to 2.5 μ were found, on cultivation long thread-like bacilli were observed to be mingled in comparatively small numbers with shorter forms. Sayce notes that the organism in his cases produced colonies similar to Pfeiffer's, was non-motile, stained feebly with Loeffler's blue, Gram-negative, and aërobic. It differed from Pfeiffer's in that some thread forms were always present, and that on primary direct cultivation (not only on subculture) stout large bacilli were formed, together with numerous filaments often very long. Professor Hewlett[6] states that the preparations from cultures show long twisted chains and threads of bacilli aggregated so as to form networks and convolutions. These chains or threads are composed of bacilli placed end to end, and united by a continuation of the cell membrane. In our example no stout bacilli as described by Sayce were found, except that although cultures taken at autopsy formed absolutely typical colonies on blood agar, a few rather swollen bacilli were noticed in the films, but these were quite uncommon, most of the organisms presenting the usually described features. Lastly, Ritchie publishes some excellent micro-photographs showing thread forms of the bacillus, and he also utters a word of caution, which we make no apology for quoting in full:

> It is thus impossible to dogmatize as to whether the organism isolated from the sporadic cases of meningitis with which we are here concerned, is identical with the organism occurring in the respiratory tract in influenza. In the meantime it is sufficient to say that there exists a group of cases which often presents pyaemic characters, in which meningitis is a very common occurrence, and in which the only organism present is a haemophilic bacillus having the characters of the influenzal bacillus.

The example recorded by Dudgeon and Adams was of

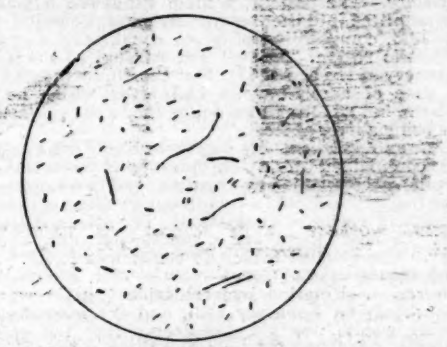


Fig. 2.—Film preparation from a pure culture of the organism on blood agar. Showing the predominant minute short type of bacillus, together with the longer filamentous forms described. Ocular No. 6; Zeiss objective 1/12. Gram preparation, counter-stain saffronin. Drawn under the camera lucida.

the pyaemic variety and appears to have been among the earliest noted. Unfortunately it was impossible for us to amplify our results by means of animal inoculations.

As regards the diagnosis of influenzal meningitis, nothing has yet been noted which can enable the observer to differentiate it from the post-basic type. It is true that in some instances wild delirium is marked, but this seems by no means common. In the case above recorded the sudden "fitting" with rapid transition to rigidity was striking, and perhaps important clinically, since one of the cases noted by Batten began in the same way.

From the statistics available, the prognosis is undoubtedly very bad, and is certainly the more severe the younger the patient. Sanger's example of a boy aged 9, who recovered, was for some time the youngest recovery recorded, but Batten's case of a child 14 months old, who was improving long after the acute stage had passed off, shows that even at the earliest age a fatal prognosis should not be absolute. The cases that survive are so few that ultimate prognosis is very difficult. In the last instance mentioned there had been blindness, which was gradually passing off at the time when Batten published his paper. A patient of Sayce was ill six months, and developed a flaccid paralysis, while Mya, in 1902, had a case which recovered but was left with a hemiplegia.

Treatment seems to have little effect upon the disease. Vaccines have been given, but the results do not appear to be encouraging. The patient aged 14 months, to whom Batten refers, was given urotropin gr. x every four hours, and recovered. In the case we decribe urotropin was used, but the dose was much smaller.

The other method of treatment, namely, spinal lavage, already referred to, was at first promising, and certainly at

the necropsy the cord showed less involvement than the brain. In other examples the cord appears to have been affected to an equal extent with the brain, but in this one there certainly was less pus in the thecal space and less softening of the tissue of the cord.

While the treatment by other means is so unsatisfactory, it seems reasonable to suggest that both urotropin and spinal lavage are worthy of further trial.

In conclusion, we desire to thank Dr. Eustace Smith for kindly permitting us to publish the notes of the case.

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THE EFFECTS OF EMETINE ON ABSCESS OF THE LIVER.

BY R. L. SPITTEL, F.R.C.S.ENG.,

GENERAL HOSPITAL, COLOMBO.

I REPORT the following case in evidence of the effects of emetine injections on amoebic abscess of the liver; also because in the near future *post-mortem* examinations of cases of amoebic abscess of the liver are perhaps likely to be of greater rarity than heretofore.

History.—The patient, a male Cingalese labourer, aged 20, was admitted into the General Hospital, Colombo, on February 7th, 1913, complaining of fever, cough, and a swelling in the epigastric region. He had had parangi at the age of 7, and dysentery at the age of 17. For the three months previous to the date of admission he had fever which he ascribed to malaria, but which was no doubt due to the epigastric swelling, this being a liver abscess.

State on Admission.—He was exceedingly weak and emaciated, and complained of a chilliness and feverishness towards evening, accompanied by sweating, and of a sense of discomfort after food. There was a prominent swelling in the epigastrium suggesting a sense of fluctuation. The spleen was not palpable. Over the heart there was a haemic murmur; the lungs were clear. The general leucocyte count was 16,720. His evening temperature was 99.2°.

Operation.—Emetine hydrochloride ½ grain was given subcutaneously on February 11th, and the following day an exploring needle was plunged deeply into the epigastric prominence. As is not infrequent in these cases, no pus appeared in the syringe, but on its withdrawal, after repeated suctions, a yellow bead was noticed in the cannula. An incision was then made through the right rectus muscle, and the liver was found free from adhesions to the parietal peritoneum. The general peritoneal cavity having been packed off with gauze, the liver was incised, and 1½ pints of grumous bile-tinged pus were evacuated. Digital exploration disclosed a large loculated cavity, the walls of which, in certain directions, were quite beyond reach of the examining finger. It was flushed out with sterile water. A double drainage tube was inserted so as to fit tightly the margins of the liver incision, and gauze was carefully packed around it.

Progress.—Some foul discharge subsequently escaped, and was copious at first, but later diminished considerably in amount under treatment with ½-grain doses of emetine daily for four days. The abscess cavity was also irrigated daily with iodine lotion (tinct. iodi ℥j, sterile normal saline Oj), and 4 oz. of quinine bi-hydrochloride solution (gr. x ad ℥j) was kept in on two occasions.

The patient made good progress until February 18th—six days after operation—when, in my absence, the drainage tubes were inadvertently removed and reinserted. This interfered with the newly-formed adhesions between the liver and the anterior wall of the abdomen, allowing pus to escape into the general abdominal cavity. From this time the patient's health declined; his pulse became feeble and irregular; persistent vomiting and violent diarrhoea supervened; the discharge became foul and ochry yellow in colour from the presence of bile, and he died on February 21st—or about nine days after the operation.

Necropsy.—A loculated abscess cavity was found occupying the anterior aspect of the right lobe of the liver, of a capacity of about 4 oz.; only ¼ in. thickness of liver tissue lay between the abscess and the visceral surface of the liver. A deep recess was found leading into a saccule in the immediate vicinity of the gall bladder near the neck of which the tissues had been worn down to the thinness of parchment, and had tapped the beginnings of the hepatic ducts. The walls of the abscess and its contents were deeply bile-stained. Pyogenic membrane merged into normal liver substance through a thickness of ½ in. Microscopic examination of this part showed the rapid transition from inflammatory cells to fibrous tissue enveloping here and there single liver cells and groups of them. There were also several buff-coloured islets of pus organized into coherence and solidity; microscopically these areas showed inflammatory cells packed together, with filmy, fibrous strands between individual and groups. There was a considerable quantity of pus in the general peritoneal cavity; the mucous membrane of the colon showed a few scars of old ulcers.

REMARKS.

The noteworthy points of this case are:

1. The cavity in the liver, which at the time of operation contained 1½ pints of pus, was found nine days later to have a capacity for only 4 oz., while a very rapid advance of fibrosis was proceeding through a thickness of tissue that measured ¾ in.

2. Several separate foci of pus had been rendered inert and crystallized into solid, buff-coloured islets, which disclosed microscopically the very beginnings of fibrosis. Mere evacuations of pus and local treatment could not account for this latter phenomenon, even if they did for the former. In this connexion it may be pointed out that Rogers[1] has recorded a case in which encystment of a small liver abscess occurred under emetine.

As for the etiology of the case, I failed to find any motile amoebae even by staining processes, but the clinical history of the case is strongly suggestive of an amoebic origin, and it has been shown by Rogers that in 98 per cent. of liver abscess in the tropics amoebic dysentery is the cause; Wenyon,[2] too, has recently produced evidence to show that the *Entamoeba histolytica* of Schaudinn is the same as the *Entamoeba tetragena* of Viereck, or rather that Viereck's is the true life-history of the pathogenic amoeba that Schaudinn discovered and named.

It was not the liver abscess itself which caused the death of this particular patient, but the inadvertent removal of the drainage tubes which has been mentioned. No harm would have been done thereby if I had stitched the liver to the anterior abdominal wall at the time of the operation, but as I had no reason to anticipate the action in question I adopted my usual practice in dealing with liver abscess. In future I should give preference to Rogers's method of dealing with liver abscesses—namely, to aspirate them, inject emetine hydrochloride (1 grain to 1 oz. of water) before withdrawing the cannula, sealing the puncture with collodion, and repeating the procedure on a further occasion if required. This is because the *post-mortem* findings of the case now recorded suggest that emetine besides having a specific action on the amoebae may also be an organizing and cicatrizing agent of some value. In Rogers's words, the abscess will be found to dry up.

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HAEMORRHAGE IN A NEWLY BORN INFANT.

BY S. D. CLIPPINGDALE, M.D.,

LONDON.

I RECENTLY had to make for the coroner a *post-mortem* examination of a child 1 day old, who had died from severe haemorrhage (melaena, and haematemesis).

I found the stomach and small intestine full of blood. On washing the blood away I found the mucous membrane presented several ulcerations with bleeding points, from which the blood had come. The case seemed to me to be one of irritant poisoning, but on interrogating closely every person who had had anything to do with the child, I convinced myself that the child had had nothing but a little cold water. The midwife, however, informed me that when the child was born it was covered with a fetid "slime," which had come from the mother's passage. Not only was the child's head covered with this "slime," but some had entered the child's mouth, so much so that the midwife had to hold the child up by its feet to enable the "slime" to drop out of the mouth, and had also to resort to artificial respiration. I came, therefore, to the conclusion that the ulceration and the haemorrhage had been the result of direct bacterial infection such as occurs in dysentery and in enteric fever. The coroner, a medical man, accepted my view, and directed the jury accordingly.

I am no expert in these matters, but a noted bacteriologist, with whom I discussed this case, strongly urges that it should be placed on record.

EIGHTY-FIRST ANNUAL MEETING

OF THE

British Medical Association.

Held in Brighton on July 23rd, 24th, and 25th.

PROCEEDINGS OF SECTIONS.

SECTION OF SURGERY.

W. THELWALL THOMAS, F.R.C.S., President.

DISCUSSION ON THE DIAGNOSIS AND TREATMENT OF PRIMARY CARCINOMA OF THE STOMACH.

OPENING PAPER.

By G. H. MAKINS, C.B., F.R.C.S.,
Vice-President, Royal College of Surgeons.

IT is a matter to me of some interest to recall the fact that some thirty odd years ago, when Billroth's first stomach operations were performed, the late Sir John Erichsen in speaking to me expressed his regret that the operations should have been performed and published, as he considered their publication would entail a great deal of useless suffering on patients who were likely to be operated upon by surgeons attracted by Billroth's proposition. At the present day a great advance has been made on that position, yet it is still an undoubted fact that far fewer subjects of gastric carcinoma come into the hands of the surgeon than should be the case; again, that they do so less frequently than do patients with carcinoma of the remaining portion of the alimentary tract, although operative treatment of the disease has been ably advocated in this country by Robson, Moynihan, Paterson, and others.

The disease occurs with great frequency, since it is computed that carcinoma of the stomach accounts for 21 per cent. of all cancers, the incidence thus following closely on carcinoma of the uterus.

The fact that surgical means are not more generally resorted to in the treatment of carcinoma of the stomach depends on two circumstances: (1) The difficulty of early diagnosis of the disease; (2) the want of general appreciation of the results which can be attained.

Incidence of Carcinoma in Various Parts of the Intestinal Tract.

Year.	Stomach.	Small Intestine.	Large Intestine.	Rectum.	Total.
1901 ...	29	4	21	22	76
1902 ...	25	1	19	27	73
1903 ...	31	0	24	32	87
1904 ...	30	1	25	32	88
1905 ...	38	0	15	35	88
1906 ...	40	0	25	32	97
1907 ...	45	0	47	17	109
1908 ...	53	1	38	29	121
1909 ...	44	1	21	30	96
1910 ...	49	1	24	43	117
1911 ...	32	1	28	43	104
1912 ...	41	0	40	35	116
	458	10	327	377	1,172
	39 %	0.8 %	27.9 %	32 %	

Total number of patients for the years 1903-12, 70,234, with 403 cases of malignant disease of the stomach. Incidence, 0.57 per cent.

The above table shows:

1. The incidence of carcinoma of the stomach in patients undergoing treatment in a general hospital. Thus, of 70,234 cases treated in the medical and surgical wards of St. Thomas's Hospital, 403 were the subjects of gastric carcinoma (0.57 per cent.).

2. The incidence of carcinoma in the various portions of the alimentary tract from the stomach downwards.

It may be noted that the table shows a slight continuous increase in the number of patients coming under treatment, which probably corresponds with the slowly growing appreciation of the fact that such patients may be successfully dealt with by surgical methods. It is of some interest to compare the numbers in this table with a similar compilation made by Dr. Mayo at St. Mary's Hospital, Rochester, in which an exact reversal of the proportionate occurrence of cases of carcinoma of the stomach and carcinoma of the large intestine respectively is seen.

	St. Thomas's (12 years).		St. Mary's, Rochester (14 years).	
	Number.	Per Cent.	Number.	Per Cent.
Stomach	458	39.0	863	68.2
Small intestine	10	0.8	14	1.1
Large intestine	327	27.9	219	17.3
Rectum	377	32.0	168	13.2
Rectum and large intestine together	704	60.0	387	30.6
Total	1,172		1,264	

Operable Cases.—St. Thomas's, 31.4 per cent.; St. Mary's, Rochester, 35.5 per cent.

I believe this to depend on the fact that where operations on carcinoma of the stomach are freely performed their success is demonstrated and the supply of cases increased. Conversely, the surgical treatment of carcinoma of the bowel has acquired an earlier recognition than that of the same disease of the stomach. This is no doubt in part due to the fact that growths of the colon and rectum are more easy of diagnosis, but chiefly because the medical attendant has always been ready to resort to surgery for the relief of intestinal obstruction, which for a long period he has known could be relieved by a simple colostomy, and for a shorter period he has become familiar with the results of partial colectomy. Thus, of the 704 cases in the table, 45 per cent. were admitted for intestinal obstruction. On the other hand, the distressing results of pyloric obstruction are not to be relieved by the simple expedient of establishing a fistula, a step which for many years has acquired a definite position in the treatment of the less hopeful conditions of carcinoma of the gullet. The introduction of gastro-enterostomy made the first step in carrying the conviction that surgery could aid, and from that the possibilities of gastrectomy are only slowly gaining the notice they deserve.

THE DIAGNOSIS OF GASTRIC CARCINOMA.

The early diagnosis of carcinomata of the intestinal tract is difficult throughout, and that of carcinoma of the stomach is perhaps the most difficult of all. Yet in early diagnosis lies the whole crux of dealing with this disease on an adequate scale.

The mere persistence of symptoms of indigestion, which differ little or not at all from those accompanying simple conditions of the stomach, except, perhaps, in their intractability may be all that exists to arouse suspicion. Such symptoms occurring in any patient of middle age, especially in a man, should lead to special investigation, particularly if they commence suddenly with a previously good digestive history, or if they supervene after a long interval of health following earlier signs of a gastric ulcer.

METHODS OF INVESTIGATION.

A determination of the functional capacity of the stomach by a test meal. From this we learn that the passage of the contents of the stomach is delayed either as a result of deficient motor power, or of mechanical obstruction, either by noting the delay in digestion of certain food elements, or by the presence of an undue amount of the ingested food after an interval which should

have sufficed to allow the organ to have completely emptied itself.

Chemical tests may show us that the gastric juice is defective in some of its elements with consequent loss in digestive power. In carcinoma deficiency in the ferments is of the lesser importance since it is generally allowed that no feature pathognomonic of the disease has been actually established.

The observation of Golding-Bird, in 1842, that the free hydrochloric acid normally present in the gastric juice gradually diminishes in amount in cases of carcinoma of the stomach as the disease progresses, while the organic acids steadily increase in quantity, has of late years been further investigated by many workers. Although increased experience has fully supported Golding-Bird's observation, yet the absence of free hydrochloric acid has been found to occur in other diseases (such as chronic gastritis, alcoholic gastritis, severe anaemia, chronic pulmonary tuberculosis, and some nervous diseases), while in carcinoma it is uncertain in degree. It has been shown that in some stages of carcinoma of the pylorus hyperchlorhydria, or at least euchlorhydria, is met with, just as is found in pyloric or duodenal ulcer or simple pyloric obstruction, although in carcinoma of other portions of the stomach absence of free hydrochloric acid is the rule. This observation has led Schryver[1] and Singer to consider it probable that changes in the composition of the gastric juice depend rather on the site than on the nature of the lesion. They further conclude "that carcinoma of the stomach has no specific effect on the composition of the gastric juice, although both pepsin and chloride readings are generally lower than in other conditions."

Panton and Tidy[2] dwell upon the importance of the length of history of the individual case in forming any conclusion as to the cause of the absence of free hydrochloric acid, suggesting that in a case with two years' gastric symptoms the absence of free acid points to carcinoma, while absence of acid in a patient with four years' gastric symptoms is not likely to indicate the presence of carcinoma. The presence of abnormal organic acids, such as lactic and butyric acids, is of less constancy and importance from a diagnostic point of view, and the same remark applies to the presence of certain organisms, such as the Oppeler-Boas bacillus and the *Bacillus filiformis*, which are not uncommonly present in cases of carcinoma of the stomach.

Microscopical examination may offer further aid by revealing the constant presence of blood in small quantities, fragments of the growth, or evidence of imperfect digestion of the elements forming the test meal. The microscopic determination of the constant presence of blood in the faeces has also been regarded as an evidence of carcinoma.

It is a somewhat striking commentary on the efficiency of these methods that in the clinic of Drs. W. J. and C. Mayo,[3] where every means exist for their use, the simple plan of determining gastric insufficiency by testing the power of the stomach to rid itself of some incompletely cooked rice and raisins in eight or ten hours is used in order to decide on the advisability of an exploration.

Skiagraphy is now generally employed as an aid to diagnosis, and is capable of furnishing valuable evidence as to motor sufficiency, and the capacity of emptying itself possessed by the stomach. Beyond this, in the later stages, interference with the normal outline of the organ and deficiency in peristalsis in the affected part of the organ may point to the presence of a tumour. The beautiful series of serial radiographs produced by Professor Lewis Gregory Cole[4] of New York shows what valuable information as to the extent, position, and nature of the growth may be obtained by this method in the fully developed stages of the disease, but at present this method is too expensive to come into general use, and its value in the early stages is not yet demonstrated. Dr. Cole says even in the early cases some of his findings are sufficiently definite to justify him in stating with a reasonable degree of certainty that the process is malignant. The value of skiagraphy in readily determining the location of a tumour in the stomach or transverse colon respectively is obvious, while the method has also proved useful in determining the site and presence of a gastro-colic fistula as well as demonstrating the nature of the disease (Handek).

A number of other aids to diagnosis—such as examination of the blood, serum diagnosis, determination of the power of the stomach to assimilate certain drugs and pass them on to the urine, and the direct examination of the interior of the stomach by the gastroscope—cannot be regarded in their degree of development as of great practical diagnostic value.

In the present state of our knowledge it is, unfortunately, clear that no symptom or complex of symptoms allows of a certain diagnosis of the early stages of gastric carcinoma, and we are driven to the ruder procedure of making an exploratory incision. Even this may fail. Thus Mr. Paterson records a case in which a small carcinoma at the junction of the oesophagus and cardiac extremity of the stomach was not discovered; but it may be fairly said that at this stage of the disease, whether the condition be carcinomatous or not, no grave risk is involved in the procedure.

The diagnosis of advanced carcinoma offers less difficulty; here symptoms such as pain, vomiting, haematemesis, melaena, dilatation of the stomach, obvious peristalsis, the presence of a palpable tumour, may make the detection of the disease easy enough. The presence of a tumour is the most useful of these signs to the surgeon. It gives valuable information as to the locality of the disease, whether at the pylorus or the body of the stomach, its size, consistence, and degree of fixity. In employing this information it must be borne in mind that the tumour may have assumed an abnormal position, thus low in the abdomen, or it may be pushed over to the right by a dilated stomach or drawn up to the left by contraction of the organ. It may be difficult at once to distinguish from a tumour of the colon or pancreas. Lastly, it may be only occasionally palpable, then generally with light pressure only, and occasionally it may vary in size. With regard to the last point, it is well to bear in mind that variability in size of the tumour may be due to muscular spasm, and that this, if accompanied by pain, is far more suggestive of an inflammatory lesion than of carcinoma.

Here, again, the question of an exploratory operation may arise not for diagnostic purposes, but to determine whether the case comes within the limits of operability, and what operation is advisable. It should be said at once that an exploration in this stage of the disease should be less lightly undertaken than in the earlier stages. Experience has abundantly proved that such explorations are not devoid of danger, and should not be embarked upon without full consideration of the condition and the power of the patient to bear the operation.

Even with the advantage of direct examination the difficulties of diagnosis are not ended. The differentiation of different types of growth—for example, sarcoma, myoma, or endothelioma—may not be an exacting task, since each has some characters of its own, and each is suitable for radical treatment if operable. The differentiation of inflammatory conditions and carcinoma is less easy, and in some cases insuperable. A long clinical history, the localized nature of the constriction, and the presence of adhesions of the band form, are valuable aids in relegating a constriction of the pylorus to the inflammatory class, but in a considerable proportion of cases a doubt must exist until the matter is settled by the histologist. In such the performance of a partial gastrectomy is justified by the safety with which the operation may be performed, and the satisfactory result which may be obtained. The frequency with which these errors may be made has been well shown by Professor Alexis Thomson, who found among 24 cases of probable carcinoma 6 to be chronic fibrosis following ulceration; of 25 collected cases, 7 to be non-malignant; and of 21 museum specimens, 6 to be non-malignant, which causes him to suggest that all cases of "atrophic carcinoma" are really of a non-malignant fibrous nature.[5]

METHODS OF TREATMENT.

These depend upon the position and extent of the growth. With regard to position, carcinoma of the cardiac end of the stomach is generally unsuitable for operation, except in the form of a palliative gastrostomy.

Growths of the body of the stomach may be treated by gastrectomy, anastomosis, or, rarely, by jejunostomy. The

last operation has been advocated by Mr. Mayo Robson and Dr. W. J. Mayo, who say, in cases of cardiac obstruction and in diseases affecting a considerable portion of the wall of the stomach rendering gastrostomy impossible or difficult, jejunostomy is as efficient and easier of performance than gastrostomy.

Pyloric growths which form from 50 to 60 per cent. of the series are the most generally satisfactory cases for operation, whether by anastomosis or excision.

The limits within which radical operations may be undertaken are fairly wide. They are determined by the extent of the primary growth. Extension along the lesser curvature is the most serious direction in the localized and pyloric cases, since if the growth reaches the cardiac extremity no chance of a radical operation remains. With regard to the cases complicated by the presence of scattered nodules, it may be easier and more satisfactory to perform partial gastrectomy than to establish an anastomosis, since the removal of the nodules gives the newly-formed channel a greater possibility of escaping invasion of the growth. As to the actual extent of involvement, if a handbreadth of the cardiac end of the stomach is free it suffices to allow of a satisfactory anastomosis. Where a large extent of the central portion of the stomach is involved a total or subtotal gastrectomy may be performed, the limits of practicability being governed by the rules laid down below.

(a) The Degree of Lymphatic Invasion.

For practical purposes the classification of the glands into those of the greater curvature, the subpyloric, the retropyloric, and the lesser curvature groups is the most useful. The exhaustive study by McCarty and Blackford[6] of the glands in 200 cases of gastric carcinoma removed by operation has substantiated much that was known, and has allowed them to draw valuable conclusions.

This study shows that the regional involvement of the glands bears a definite relation to the position of the primary growth, but that the size of the primary lesion has no corresponding effect on the extent of the glandular enlargement. Again, that clinically there is no apparent relation between the duration of the symptoms and the extent of the glandular enlargement. The size of enlarged glands is no indication of carcinomatous involvement; large glands may be inflammatory, small ones carcinomatous. Again, as in the case of intestinal carcinomata, the path of invasion is not always obviously continuous, glands or groups of glands being skipped. In McCarty and Blackford's series 1,404 glands were examined microscopically, and in these carcinomatous invasion was proved in 52 per cent. It is also shown in this series of cases that both the immediate mortality and the length of interval before recurrence of the disease were directly affected by the extent of the glandular involvement.

(b) Direct Extension to Neighbouring Organs.

Involvement of the transverse colon and transverse mesocolon is perhaps the least formidable. The main point to bear in mind in dealing with the mesocolon is the middle colic artery, and, if this cannot be spared, the whole transverse colon must be sacrificed. Many cases of successful removal of growths involving both stomach and transverse colon have been recorded. Perthes[7] has recommended that both growths should be removed in one mass, and records four operations with one death. He points out as an inducement to perform this operation that the growth in such cases involves the greater curvature of the stomach, the region in which glandular involvement is most hopefully dealt with.

(c) Extension to the Duodenum.

This is comparatively rare. Langwill,[8] in a study of 200 cases in Professor Caird's clinic, found it to have occurred in 5, or 2½ per cent. It is well to bear in mind at an exploratory operation that tumours of the florid variety often project freely through the pylorus into the lumen of the duodenum without involving its wall.

(d) Pancreas.

When carcinoma of the lesser curvature, especially carcinoma engrafted on an old ulcer, extends into the body of the pancreas, the case must be regarded as unsuitable for operation. In a certain number of cases either the primary growth or the retropyloric glands may involve a part of the head of the pancreas; in this situation portions of the gland may be successfully removed, the peritoneum being sutured over them.

Extension to the Liver and Gall Bladder.

This is an undesirable complication, but portions of the liver have been successfully removed by Mayo Robson and others, while the addition of a cholecystectomy is not a serious addition to a partial gastrectomy.

CONTRAINDICATIONS TO OPERATION.

The general condition of the patient may be a bar to any form of serious operation; in some such instances a preliminary jejunostomy has been proposed. It suffices to

Fig. 1.—Wilms.

enumerate such contraindications as visceral metastases ascites, extension to the abdominal wall, or distant lymphatic enlargements, as in the posterior triangle or the groin. The question may be raised whether apparent extension of glandular involvement to a degree incompatible with complete eradication is to be looked upon as an actual bar to the operation of gastrectomy. In answer to this it may be replied that a doubt may always exist as to the nature of the glands left behind; and secondly, that the patient may be much better, even if some glands do remain, when the primary growth is of the florid variety or is ulcerating, than with the alternative gastro-enterostomy.

Gastro-enterostomy is almost as severe an operation as partial gastrectomy, and the duration of the relief it affords does not exceed an average of five months. It must be allowed in stating this general average that the cases

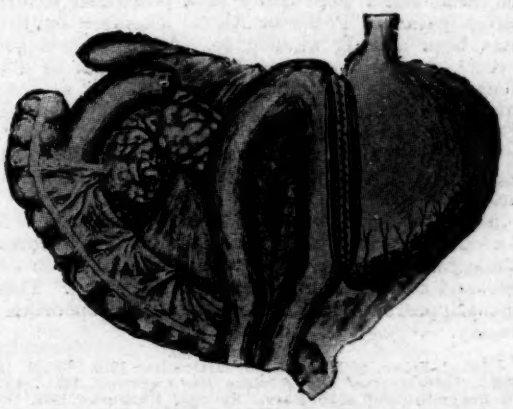

Fig. 2.—Polya, Reichel.

dealt with include the most unpromising for any form of treatment; but gastro-enterostomy, as the less satisfactory procedure, should be resorted to only in cases in which the state of the patient or the extent of the growth renders the more radical procedure impracticable. The objection to gastro-enterostomy, even as a preliminary procedure, is a real one. The technical conditions may be influenced for the worse when the second operation is undertaken, while, the patient often withholds consent to the second operation too long, as a result of the temporary relief following the establishment of the anastomosis.

The best method of partial gastrectomy is an operation on the lines of Billroth No. II, either a posterior or anterior gastro-enterostomy being performed, as may prove the more convenient in the individual case.

When the remnant of the cardiac end of the stomach is too small to allow of a convenient lateral anastomosis, the loop of jejunum may be applied directly to the opening of the divided stomach by one of the methods devised by Polya, Reichel, Wilms, etc.[9] (Figs. 1 and 2).

One other technical point should be raised. In early days especially, leakage from the duodenal stump was a troublesome and often fatal sequela to the operation. This even led some surgeons to advise that the severed end of the duodenum should be fixed in the abdominal wound. The difficulty should only occur if the duodenum has needed to be cut very short; in this case it may be sewn down to the peritoneum over the pancreas. Lewitt[10] has suggested that an end-to-side anastomosis of the duodenum into the distal limb of the loop of jejunum attached to the opening in the stomach should be made, and has employed the method with success (Fig. 3).

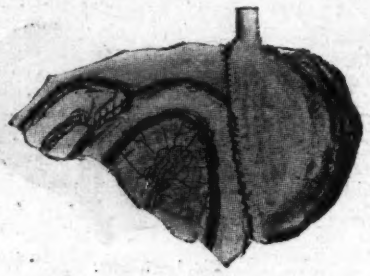

Fig. 3.—Lewitt.

With regard to the immediate mortality of the operation of partial gastrectomy, it may be pointed out that it has always been lower than that which occurred with the earlier partial colectomies, and yet allowed the latter operation to become firmly established. This is readily intelligible, since the danger of peritoneal infection is far less than in the case of the colon. Published records have stated the mortality as high as 30 per cent. and as low as 10 per cent., and with the development of more satisfactory technique it is steadily decreasing. The largest and most successful series published, that of Dr. W. J. Mayo, places the immediate mortality at 10 per cent. In my own experience the immediate mortality nearly doubles this figure. With regard to the permanent results to be obtained, no doubt these are to a certain extent vitiated by the fact that a definite proportion of the cases classed as carcinomata were really of a cicatricial nature. The investigation of Professor Alexis Thomson on this point has been already alluded to. Allowing this source of error, which with present knowledge must be a steadily decreasing one, the permanent results are as good as in any operation for malignant disease and better than most. Surgeons performing this operation have cases of five years' freedom from recurrence, while a considerable proportion of the patients undergoing the operation live much longer.

Dr. Mayo sums up the chances of the patient as follows: In operable cases a 90 per cent. chance of recovery from the operation exists, a 36 per cent. chance of three years' life, and a 25 per cent. chance of five years. This statement appears to furnish the ideal as the operation stands to-day.

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DISCUSSION.

Mr. E. W. HEY GROVES (Bristol) said that in considering the difficulty in diagnosis there was great danger in the number and complexity of the new diagnostic methods now being put forward. Many of them took time, and none held out reasonable certainty of accurate diagnosis. In 20 to 30 per cent. they never could be certain of diagnosis—certainly not before exploratory operation. Valuable time might be lost while the patient was being kept under observation; this time should be occupied with an exploratory operation. A fallacy underlay the expectation that definite diagnosis could be made by chemical and physical means; it was assumed that every case was either definitely malignant or definitely benign. But they knew that many cases of malignancy had been benign or inflammatory. It was not reasonable to expect any test to definitely differentiate between these two conditions where the case was doubtful. The next point was the difficulty in diagnosis even after the abdomen was opened, and if such difficulty existed it was impossible to be certain by means of the gastroscope or test tube. He was doubtful if even the presence of apparent metastasis was sufficient to make diagnosis certain. In a case lately under his care there were in the quadrate lobe of the liver, in close contact with the stomach, two nodules which he regarded as metastatic growths. Pyloric obstruction existed, and gastro-jejunostomy was performed. Fortunately the patient refused further operation, and he now was in robust health, the nodules evidently not being malignant. He was formerly of opinion that in suitable cases the great omentum should, where possible, be removed with the growth. He was now more certain of that than ever; the only extension of the growth might be into the lymphatics of the great omentum. Its removal added very little to the difficulty of the operation.

Dr. T. KENNEDY DALZIEL (Glasgow) thought that concerning the diagnosis of carcinoma of the stomach they were in the same position as in the diagnosis of carcinoma in other situations, such as the breast. When the cancer ulcerated in the stomach changes in the gastric juice occurred which rendered the diagnosis suggestive. As soon as ulceration began they almost constantly found minute traces of blood in the gastric contents; that was a factor of great importance. He laid stress on the peculiar facies of these cases; it was not a certain guide but it was of some importance. In pyloric cancer they had, as a rule, symptoms of obstruction so direct that coming after a history of indigestion they should never hesitate to recommend immediate operation. Cancer of the body of the stomach might go on to great advancement without material symptoms showing themselves. He quoted the case of an aged lady who was found to have suffered for years from cancer of the body of the stomach, and whose only symptom was persistent flatulence. He deprecated the performance of a partial operation. For the past ten years it had been his rule fearlessly to remove the greater part or even the whole of the stomach. He did not approve of any operation which entailed tension, as in fixing duodenum to remains of stomach. They must try to avoid tension. He preferred end-to-end anastomosis of jejunum to oesophagus or small portion of stomach left. Operations on the stomach could be done confidently, as the possibility of sepsis arising from the contents was exceedingly slight, and fear of sepsis may be put aside. In the last five years he had performed forty-five partial or complete gastrectomies with the loss of only three cases; one from collapse after the operation, one from peritonitis due possibly to defective technique, and the third from thrombosis of abdominal veins. He had not infrequently removed the transverse colon with the stomach, but all the cases suffered recurrence. He would not remove the omentum as recommended by Mr. Hey Groves; he regarded omental infection as arising in consequence of infection of general peritoneum and the gathering up by the omentum of cancer cells. The results in reference to cure would be based on the same considerations relating to cancer elsewhere, and early and thorough operation would give results better than in cancer in other situations.

Mr. R. JOWERS (Brighton) thought that very few cases of early cancer of the stomach came into the hands of the surgeon. In the early stages there were no symptoms at all until mechanical or other causes gave rise to pain. He employed gastro-jejunostomy after closure of the ends of the stomach and duodenum. On one occasion he implanted the duodenal stump on the posterior wall of the stomach with satisfactory results. He had had no case which lived more than two years after operation.

Mr. A. H. BUCK (Brighton) said: With regard to the diagnosis of cancer of the stomach, the point which has impressed itself most firmly on my mind is the fact that there is a large proportion of doubtful cases in which, notwithstanding chemical tests, bismuth meals for the

purpose of *x*-ray photography, gastroscopes, and all the other methods of diagnosis at our command, the actual determination of the presence of carcinomatous cells can only be fixed by the microscope after removal of a portion or the whole growth by operation. More particularly does this apply to the earliest stages of carcinomatous growth. Of course I feel very strongly that in such cases the only point on which one should be dogmatic is their uncertainty. One has so often seen preconceived ideas upset at operations that I have been forced to the conclusion that early exploratory operations, with the determination to act as conditions found indicate, is the safest way of dealing with doubtful gastric cases in the best interests of the patient. Also there is the fact that one cannot—as I think Mr. Makins pointed out—possibly say what the extent of gland infection is without exploration. I would particularly mention that it is not only my own diagnoses that have proved wrong on operation, but those made by various physicians, some of them of worldwide reputation, who have had every opportunity with test meals and all the other diagnostic methods of coming to a correct conclusion. I have four times performed a preliminary gastro-jejunostomy and subsequently removed pyloric tumours believing them to be malignant. In each of these instances the microscope proved the tumour to be an inflammatory mass around a chronic ulcer. These cases have occurred during the last eight years. None of the patients had any further gastric symptoms, but one operated on eight years ago died this year of inoperable cancer of the rectum. In another case, five years ago, I found a movable pyloric tumour and performed a gastro-jejunostomy. Pylorectomy was advised but refused, but the patient came back to me in three months and asked me to do a further operation. On exploration I found that the mass had extended upwards and apparently into the liver and backwards to pancreas and abdominal vessels—that it was fixed and inoperable. I had to tell her that she was suffering from inoperable growth. The woman returned to her home in the country, and is alive and well to-day. I was certainly of opinion that this was a carcinomatous case, but now believe it to have been an infiltrating brawny chronic inflammatory mass. Six months ago I had to explore a gastric case where a very definite diagnosis of carcinoma of the body of the stomach had been made by a hospital physician who had had the patient under observation for five weeks, and, I believe, applied all the known tests except the gastroscope. This man had a pyloric tumour immovable on account of its fixity. After gastro-enterostomy he put on weight to 12 st., and is now perfectly well and following his occupation of blacksmith. I hope and believe the mass was inflammatory. But if there can be so much doubt after seeing the mass and having it in one's hands, and even, in those cases where one can remove the tumour, after cutting into it with a knife and examining the cut section with the naked eye, I do not believe that a correct diagnosis can be made in doubtful cases except with the microscope. If I had gastric symptoms myself which interfered with my daily life, and which did not yield to ordinary medicinal treatment, I should not hesitate to have an exploratory operation done, for whatever the results of various tests I should not be satisfied that there might not be grave mischief present, and, if there were, we know that operation is the only possible cure. The great trouble, as Mr. Makins pointed out, has been that one but seldom operates on carcinoma of the stomach sufficiently early. Complete removal of the stomach is, I believe, not such a serious and dangerous operation as might be imagined, provided the patient is in a fair condition when operated on. With reference to surgical interference with the pancreas, I might mention that I have removed the left half of that organ in a case of rupture without any bad symptoms supervening in a child of 5 years. In irremovable cancer cases gastro-enterostomy is, in my opinion, useless unless the opening can be made well on the cardiac side of the growth. When this has been impossible I have done an enterostomy and fed the patient by the bowel. The results, however, are, naturally, not very encouraging.

Mr. D. P. Dalbreck Wilkie (Edinburgh) referred to the dangers associated with the operation of pyloro-gastrectomy, more especially to the danger of leakage from the duodenal stump. He was convinced that this complication was usually due to a necrosis of the duodenal wall at the line of suture, owing to an interference with its vascular supply. It was noteworthy that this complication frequently occurred not in the cases where the duodenum was short and difficulty had been encountered in invaginating it, but in cases where the duodenum was comparatively lax and where great care had been taken in dealing with the stump. If it were borne in mind that the upper half of the first part of the duodenum was supplied by the supraduodenal artery coming from above and reaching the upper border of the duodenum about 1 inch beyond the pylorus, and that the anastomosis between the branches of this vessel and those of the other duodenal arteries was often particularly meagre, it would be seen that when an invagination was made within the area supplied by this vessel, the sutures were very liable to occlude the vessel itself at the upper border of the duodenal stump. From injection experiments on the cadaver, in which a pylorectomy was performed and the vessels were injected, he had found that a sufficiently nourished duodenal stump could be ensured in one of two ways—either by cutting the duodenum across close to the pylorus, so that the area of invagination lay proximal to the supraduodenal artery, or possibly better by dividing the duodenum ½ to 1 in. from the pylorus, dividing the hepato-duodenal ligament and the supraduodenal vessels and then making a generous invagination of the stump, so that the final Lembert sutures were placed in vascular duodenum supplied by the pancreatico-duodenal branches.

Mr. McAdam Eccles (London) said: If surgery of the stomach in cases of primary carcinoma of the organ is to be radical and not merely palliative, early diagnosis is imperative. All are agreed that every means should be taken to endeavour to make the diagnosis admit of explanation, but also all will allow that much valuable time is often lost by non-operative treatment lines of diagnosis. Hence early exploration, as Mr. Makins has urged, is imperative. To certain points in this early diagnosis by exploration attention should be directed. Before exploration the consent of the patient should be obtained for any operation desirable. Supposing the abdomen is opened, what are the lines on which a diagnosis may be made? To my mind the first important point, when there is no tumour present, induration is of great value. This induration may be inflammatory solely, may be inflammatory *plus* malignant growth, or may be almost entirely carcinoma. Personally, I believe the correct procedure in cases of doubt is then to open the stomach on the proximal side of the induration, then to evert the affected area of the stomach wall through the gastric opening. It is possible now to see the mucous surface of the indurated part, and this inspection may show so suggestive an appearance of malignant disease that the diagnosis is settled. But supposing there is still a doubt, then a V-shaped piece of the affected area near, but not at its edge, should be removed and at once submitted to microscopical examination in a fresh section. If this reveals a carcinomatous nature, then there is a case in a stage the most favourable for a radical cure by excision. The proper procedure in such a case I believe to be (1) to excise widely the affected area, (2) to remove all glands in the three sets, whether these appear to be involved or not, and (3) usually perform a posterior gastro-enterostomy.

Mr. Betham Robinson (London) emphasized the fact that considerable difficulty might arise when the growth was in view as to whether it was of an inflammatory character or carcinomatous. He referred to a case in his own experience where there was a marked localized growth at the pylorus without adhesions and without glandular involvement. A preliminary incision was made on the stomach side and the growth inspected; there was seen hypertrophy and warty appearance of the mucous membrane, which was quite soft, and below this was felt infiltration of the pyloric wall, which was not nodular. As the condition was so suspicious of an early carcinoma it was decided to act on this suspicion, and pylorectomy was performed. The patient made an uneventful recovery. The histological report of the tumour showed that there was no sign of carcinomatous change in the mucous

membrane or tissue below. It was now sixteen months since the operation, and the patient was in perfect health.

The PRESIDENT drew attention to the utter unreliability of the free HCl test, and urged the attempt being made to excise gastric ulcers rather than do simple gastro-enterostomy. The difficulties after laparotomy of differentiating tumours need not trouble them; all should be removed.

Mr. MAKINS, in reply, said that he could not agree with Mr. Hey Groves in advocating removal of the omentum. The omentum was likely to be affected in carcinoma of the greater curvature of the stomach, and, if so, it was one of the most satisfactory places for cancer to appear, in so far as it gave rise to but little disturbance. Nor could he follow Dr. Dalziel in commending the removal of the whole stomach; he thought it sufficient to remove the lesser curvature. On the whole, there was no advantage in removing more than the amount of stomach involved. It was difficult to decide how far glands should be removed. He would be prepared to remove the growth alone, even though he could not remove the whole of the glandular implication. All the glands might not be carcinomatous, and therefore the patient should have the advantage of that chance. In regard to Mr. McAdam Eccles's recommendation to open the stomach itself to examine the growth from within in doubtful cases, he was personally opposed to such a proceeding in a case where he would simply have to stitch up that opening again. There was no harm in removing a tumour which proved to be simply an inflammatory one. The patient was better without it, so that if a tumour were present it should be removed, and there was no necessity to inspect it from within.

EXPERIMENTAL OBSERVATIONS ON THE CAUSE OF DEATH IN ACUTE INTESTINAL OBSTRUCTION.*

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THE high mortality which is still associated with operations for acute intestinal obstruction lends a peculiar interest to all investigations regarding the cause of death in such cases. Any advance in the treatment of acute ileus must be based on a more exact understanding of the relative importance of the various factors which make for a fatal issue in this malady.

In spite of the great amount of experimental work which has been carried out with the object of determining the cause of death in intestinal obstruction considerable diversity of opinion still exists regarding this subject, and it was by reason of this lack of concord in the results of previous observers that the present writer was induced to carry out the series of experiments with which this paper deals. The three theories which are at present held regarding the cause of death are:

1. That it is due to a secondary peritonitis.
2. That it is due to a splanchnic paresis, a draining of the body fluids into the portal area, followed by cerebral anaemia.
3. That it is due to toxaemia resulting from the absorption of poisonous products from the afferent bowel.

In discussions on this subject too little attention has frequently been paid to the distinction which must be drawn between simple obstruction of the intestinal lumen and obstruction *plus* interference with the blood supply of a segment of the gut. The classical experiments of Kader[1] showed how all-important is the latter factor, and in this paper these two fundamentally different types of obstruction will be dealt with separately.

Simple Obstruction of the Intestinal Lumen.

My experiments dealing with primary facts in regard to simple obstruction of the intestine I will merely mention, as they fully confirm the results of other observers. Thus I found that obstruction was more rapidly fatal the higher up in the intestine it was situated. This fact is most clearly brought out in dealing with an animal, such as the rabbit, which does not vomit. Thus, whilst an obstruction of the colon in this animal is survived for about ten days, an obstruction of the ileum is fatal in from four to five days, and one at the distal end of the duodenum in, on an average, seventeen hours. In the cat and dog, as also in the human subject, this difference is not so striking, but still holds good. My experiments also confirmed the fact so clearly shown by McClure,[2] that in the afferent bowel there is an enormous increase both in the number and in the virulence of the bacteria; and although this fact is most striking in low obstructions, it is also well marked in cases where the obstruction is situated high up in the small intestine. Also in regard to the question of peritonitis, my work confirmed that of all recent observers, with the notable exception of Borszéky and Genersich,[3] in showing that death usually results before any appreciable infection of the peritoneum has taken place. In the vast majority of my experiments, in which an accidental infection could be excluded, cultures from the peritoneal cavity were negative.

Perhaps the most striking feature in the *post-mortem* appearances in cases dying from simple obstruction is the accumulation of fluid in the afferent intestine and in the portal vessels, the scanty amount of blood in the systemic blood vessels, and the dryness of the skeletal tissues. Braun and Boruttau[4] maintain that in this drainage of the body fluids into the splanchnic area is to be found the true cause of death in obstruction of the intestine.

Toxicity of the Intestinal Content.

Nicolaysen[5] was the first to bring forward experimental evidence in favour of the view that toxaemia from the retained intestinal content was the cause of death in cases of obstruction. He collected the content from the afferent bowel in a case of acute obstruction in the human subject, filtered the content through a Chamberland filter, and injected the filtrate into the peritoneal cavities of a mouse and a guinea-pig. Both of the animals succumbed within twenty-four hours. Following this, elaborate experimental researches by Kukula[6] and Clairmont and Ranzi[7] appeared to establish the fact that toxic products developed in the afferent bowel, mainly as a result of bacterial activity, and that absorption of these poisons into the circulation accounted for the symptoms and the fatal issue in acute ileus. The theory of death from acute intestinal toxaemia has influenced very greatly the surgical treatment of the condition. At the present time many surgeons maintain that at operations for acute intestinal obstruction it is not sufficient to relieve the mechanical obstruction, but that measures must be taken to remove the toxic content which fills the afferent bowel, whilst many emphasize the danger of allowing the poisonous content to flood the empty efferent bowel, by which they maintain it is "greedily absorbed." It was imbued by this toxic theory that I commenced my investigations with the object of finding out how this toxaemia could best be combated. That such toxaemia could not be purely bacterial in nature was clear from the fact that death occurred earlier when the obstruction was situated high up in the relatively sterile reaches of the intestine than when in the ileum with its luxuriant bacterial flora. The work of Roger[8] and of Draper Maury[9] seemed to indicate that there were two types of death from obstruction of the small intestine—the one occurring in obstruction situated high up close to the duodenum, an auto-intoxication from some disturbance of the duodenal secretion; the other, met with in obstruction low down in the small intestine, an exo-intoxication bacterial in nature. I therefore carried out separate investigations in regard to simple obstruction at the high and low levels.

High Intestinal Obstruction.

This is met with in the human subject most typically in cases of gastro-mesenteric ileus resulting from pressure on the third part of the duodenum by the root of the mesentery either as a primary mechanical obstruction or secondary to a gastric paresis. The experiments of Maury, of Stone, Bernheim and Whipple,[10] and of Bunting and Jones[11] all pointed to there being produced, in cases of duodenal obstruction, some toxic body the absorption

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of which led to a rapidly fatal issue. The results of the two latter groups of observers also indicated that such a toxic substance was formed by the perverted activity of the duodenal mucosa and was independent of the biliary and pancreatic secretions. Whilst there can be no question as to the toxicity of the content of an obstructed duodenum when injected intravenously or intraperitoneally—I have repeatedly found such injections caused death with paralytic and spastic phenomena in a matter of from ten minutes to two hours—no conclusion can be drawn from such experiments, as Magnus Alsleben[12] has shown that the normal secretions from the upper part of the intestine injected in this way are highly toxic, more especially after a meal rich in protein. When the duodenum of a rabbit is obstructed in its distal part by a ligature death results in about seventeen hours. *Post mortem* the stomach is found enormously distended, studded with petechial haemorrhages, contains a thick mucoid acrid-smelling fluid, and shows numerous haemorrhagic erosions of its mucous lining.

In a series of seven rabbits I obstructed the distal end of the duodenum by means of a ligature, and at the same time drained the duodenum above this to the exterior by means of a rubber tube. The average duration of life in these animals was thirty-six hours, and during this time they lost more than a third of their body weight. As Matthews[13] had shown the vital importance of the duodenal secretion, I performed another series of experiments, in which, besides obstructing and draining the duodenum, I performed a jejunostomy and fed an extract of duodenal mucosa into the jejunum, but without appreciably prolonging life.

In another series of six animals I performed the same operation, but introduced at intervals through the jejunostomy opening the content from the duodena of rabbits which had died from simple duodenal obstruction, again with no appreciable effect on the length of survival of the animals. In a further experiment the content of the duodenum of a rabbit which had just died of duodenal obstruction was introduced into the duodenum and upper part of the jejunum of another rabbit without any obstruction being produced. This was carried out on two animals, but without producing the slightest effect on the health of either. I concluded from these experiments that the content above a duodenal obstruction was not markedly toxic when introduced into the intestine, and that the loss of fluid into the intestine, combined with the shock associated with the acute distension of the stomach and duodenum, might in great measure account for death. One could not exclude, however, a toxic absorption occurring as a late event after the distension of the duodenum had led to a loss of the vitality and integrity of its mucous coat.

Isolation of a Duodenal Loop in the Cat.

Stone, Bernheim and Whipple, experimenting with dogs, found that if a portion of duodenum, extending from just below the entrance of the pancreatic and bile ducts to the duodeno-jejunal junction, were isolated between two ligatures and a gastro-jejunostomy performed to preserve the continuity of the alimentary canal, the animals died within from twenty-four to forty-eight hours, apparently from an acute toxaemia. If the isolated duodenal loop were drained the animals survived for weeks. They found the content of such a closed loop, as also an extract of its wall, to contain a highly toxic substance which withstood filtration and heating at 60° C. for several hours.

I have repeated these experiments on cats, but with entirely different results. The following experiment was carried out on four cats:

Under chloroform and ether anaesthesia the abdomen was opened and two ligatures of fine rubber tubing were tied round the duodenum, the one just distal to the point of entrance of the bile and pancreatic ducts, the other just proximal to the duodeno-jejunal junction. A posterior gastro-jejunostomy was then performed. For the first three days after this operation the cats, with one exception, appeared well and showed little evidence of toxaemia, so much so that on the third day one of them was reopened to make sure that the ligatures had not cut through nor slipped. The ligatures were found to be firm and *in situ*, the duodenal loop being greatly distended and congested. This animal died on the following (fourth) day, and *post mortem* the striking feature was the extraordinary degree of fatty degeneration of the liver, which resembled that seen in delayed chloroform poisoning. There was no peritonitis. The duodenal loop was deeply congested, contained blood-stained, foul-smelling content, and its mucosa showed extensive ulceration along the antimesenteric border. In this case there was certainly evidence of a profound toxaemia, but one could not exclude a post-anaesthetic poisoning. The other cats lived for periods of three, six, and eight days respectively, and, although sleepy and apathetic, showed no evidence of profound toxaemia until within a short time of death. *In each case death was due to peritonitis the result of a necrosis of the duodenal wall* and leak at one of the sites of ligature. In no case did the liver show a marked degree of fatty change. In one case the mucosa of the duodenal loop was necrotic throughout; in the other two it showed areas of superficial necrosis and numerous haemorrhagic erosions.

The impression conveyed by these experiments was that whether the content of a closed duodenal loop in the cat be very toxic or not, it is apparently not absorbed freely in its toxic state so long as the mucosa is intact. To test this point further the following experiment was carried out on two cats:

Under ether anaesthesia a loop of duodenum was isolated by ligatures as in the previous experiments, but before tightening the lower ligature the loop was distended, by means of a needle and syringe, with the content of the duodenal loop of an animal which had just died from this form of duodenal obstruction. A posterior gastro-jejunostomy was then performed in each case. These animals therefore, started out with their duodenal loop filled with this possibly toxic content.

The one animal showed little or no evidence of toxaemia on the first two days following operation; on the third day it appeared somewhat apathetic, though it moved about and was certainly not acutely ill. It was killed on the fourth day, and *post mortem* there was found a generalized peritonitis due to a perforation of a necrotic area under one of the ligatures. The loop contained some solid material, evidently the residue of the content injected at the operation.

The second animal remained well for the first four days after operation and showed no symptoms of toxaemia.

On the fifth day it was obviously acutely ill and was consequently killed. At the *post-mortem* examination it was found that a perforation of the loop had occurred close to one of the ligatures. In neither case was there any noteworthy degree of fatty change in the liver.

These experiments demonstrated the important selective and neutralizing function of the intestinal mucosa, for until distension had interfered with the vitality of the mucous lining of the gut, absorption of toxic bodies was not noteworthy. In simple duodenal obstruction, therefore, where the mucous coat of the bowel remains more or less intact, I concluded that the acute symptoms are due as much, if not more, to loss of fluid as to absorption of toxic bodies. The fact that I was able to delay death in both cats and rabbits by subcutaneous saline infusions supported this view, whilst the work of McLean and Andries[14] and the results obtained by Hartwell and Hoguet[15] in duodenal obstruction in dogs fully confirmed it. These observers found that death could be delayed for several weeks if loss of fluid by vomiting and by the urine was more than made up for by copious subcutaneous saline injections.

Value of Subcutaneous Infusions.

If an obstruction of the distal end of the duodenum be produced in a cat, the animal presents symptoms closely resembling those of gastro-mesenteric ileus in the human subject—namely, thirst, lethargy, and occasional vomiting of large quantities of bilious fluid—the animal rapidly losing weight, and dying usually within seven days of the onset.

If, however, the animal be given daily by subcutaneous injection, a large quantity of saline, or, still better, a quantity of a 3 per cent. solution of dextrose in addition to the saline, not only will it show immediate improvement, but life will be prolonged for many days beyond that of a control animal. Clinical experience fully supports the experimental evidence of the supreme value of supplying the depleted systemic vessels with fluid in cases of high intestinal obstruction. Part of the value of the administration of large quantities of fluid must almost certainly be the enhanced secretory activity of the kidneys thereby produced. The impeded and sometimes almost arrested renal function which is met with in cases of high obstruction as a result of the depletion of the systemic circulation must itself constitute an important factor in producing a fatal issue.

Simple Obstruction of the Ileum.

A study of obstruction in the lower part of the small intestine of the cat throws much light on the relative

importance of the various factors making for death in acute intestinal obstruction. If the lower end of the ileum of a cat be cut across and both ends invaginated, the health of the animal does not appear at first to be much disturbed. For the first week after such an operation the animal will move about freely, eat readily though sparingly, will not, as a rule, vomit, and, apart from a loss of flesh and a gradual enlargement of the abdomen, will appear healthy. In a series of animals thus treated I found that the duration of life varied from eight to nineteen days (the animals were killed when grave symptoms developed). After the first week, the animals appeared somewhat apathetic and slept more than usual, but never exhibited any of the symptoms which we associate with acute intestinal obstruction. *Post mortem* in such cases enormous distension of the afferent bowel is seen. There is, as a rule, no peritonitis and little or no free fluid in the peritoneal cavity. The lower end of the afferent bowel is filled with solid, almost scybalous faecal matter, above this is foul-smelling liquid faeces. Microscopically, the mucous membrane of the distended bowel shows little change from the normal; as a rule, there is no evidence of ulceration, but when this does occur it is situated close to the obstruction. The liver and kidneys do not show any noteworthy degree of degenerative change.

Numerous experiments were made by injecting the intestinal content, filtered and unfiltered, boiled and unboiled, into other animals intravenously and intraperitoneally, and, although when injected in sufficient amount such content was markedly toxic, the surprising fact to me was the large amount which some animals would tolerate. I will not detail such experiments, as they are purely of scientific interest, not being comparable to anything which occurs in the human subject. The point of practical importance appeared to be to ascertain the extent to which toxic absorption occurs through the intestinal mucosa when the intestine is filled with obstructed content. I therefore carried out two series of experiments.

In the first series, the content from an obstructed small intestine was injected into the unobstructed small intestine of another animal. Eight experiments of this nature were performed, 5 on rabbits and the rest on cats.

In each case the abdomen was opened under ether anaesthesia, a loop of jejunum brought out and the abdominal cavity packed off with sterile gauze. A fine purse-string suture was then inserted into the wall of the gut, and into the centre of the area thus marked out the needle of a Record syringe was plunged, and the whole of the fluid content from the intestine of an animal dead from a simple obstruction injected. On withdrawing the needle the purse-string suture was tied and reinforced by one or two Lembert sutures. In spite of the utmost care to prevent soiling of the operative field, two of the animals died of peritonitis on the second and fourth days respectively. None of the animals presented symptoms referable to intoxication during the first twenty-four hours, and although two of the rabbits died of acute enteritis on the third and sixth days respectively, this was partly accounted for by the fact that in both cases the intestinal content had been injected cold.

In another experiment eight fluid ounces of intestinal content from a case of obstruction in a human being was injected into the small intestine of a dog, which showed few symptoms and made a prompt recovery.

The impression conveyed by these experiments was that the mucous membrane of normal intestine offers an effective barrier to the rapid absorption of large quantities of the products of intestinal putrefaction, and that the danger of absorption from the empty efferent bowel after the relief of obstruction has probably been exaggerated.

In order to gauge the relative importance of toxic absorption from the afferent bowel in bringing about the fatal issue, I carried out a second series of experiments, in which, having produced a simple obstruction at the lower end of the ileum, I filled the intestine above with the content of the small intestine of an animal which had died from a similar obstruction. I calculated that if toxic absorption had killed the latter animal, and if the former started out with its obstructed intestine filled with toxic content, symptoms of toxaemia should very quickly supervene, for, as Enderlen and Hotz[16] have pointed out, the active peristaltic movements which characterize the early stages of an obstruction tend to accelerate absorption, whilst the work of Clairmont and Ranzi, and of Braun and Boruttau clearly proved that absorption from obstructed intestine becomes very slow in the later stages.

This experiment was carried out in six animals, and again one was met by the difficulty of preventing peritonitis, the least soiling of the peritoneum with the highly infective content leading to a fatal peritonitis. The animals survived for periods varying from two to seven days, four of them dying of peritonitis. In no case was there evidence of any marked toxaemia within the first thirty-six hours, and, as in the previous series of experiments, the impression conveyed was that absorption of the content of obstructed intestine through healthy intestinal mucosa does not lead to acute toxic symptoms.

The outstanding difference between high and low intestinal obstruction in cats is that in the former a large amount of fluid from the actively secreting upper part of the intestine is lost by vomiting, whereas in the latter the fluid of the secretions of the upper part is reabsorbed lower down and life is consequently prolonged. Absorption of toxic bodies in simple obstruction is a slow process, and does not lead to the symptoms of acute ileus. In the surgical treatment of simple obstruction, infection and not toxaemia from intestinal absorption is the danger to be guarded against.

Obstruction of Lumen plus Interference with Vascular Supply.

As the majority of cases of acute intestinal obstruction which come under the care of the surgeon belong to this group, it requires the most careful study. In spite of Kader's work many of the later observers have ignored the paramount importance of the vascular factor in producing the typical symptoms of acute ileus. In this class of case the symptoms are much more dramatic than those met with in simple obstruction, to which they bear little resemblance. Albeck[17] and Murphy and Vincent[18] among recent investigators are the only workers who have given due weight to the essential difference between the two conditions. As a result of the experiments which they carried out they came to the conclusions that in cases where a loop of intestine was strangulated, death resulted from toxaemia from the absorption of poisons generated within the strangulated loop. Albeck believes that such poisons belong to the putrefactive class, whilst Murphy and Vincent maintain that they are bacterial toxins.

I have carried out a series of experiments on cats with the object of determining what part toxaemia played in causing the symptoms and the fatal ending in cases of strangulation of the intestine. In my earlier experiments I found that the method of strangulating a loop of intestine by a rubber band or similar contrivance was too uncertain. I found, as did Murphy and Vincent, that obstruction of the venous return was the most important factor in producing an early fatal result, and that the complete necrosis of an isolated loop of intestine resulting from a ligature of both its arteries and veins was survived for a considerably longer time than was the haemorrhagic infarction which resulted from a ligature of its veins alone. I therefore took as a standard operation the isolation of the lowest 12 to 20 cm. of ileum by tightly ligaturing the intestine at either end with a rubber band, and then ligaturing the veins returning from this loop. The symptoms following this operation were very similar to those met with in cases of acute internal strangulation in the human subject, and death resulted in, on an average, thirty hours. *Post mortem* the loop was found to be of a deep prune colour, tensely distended with foul-smelling blood-stained content, which swarmed with bacteria. The surface of the loop was covered with a fine layer of fibrin, and cultures from this in the majority of cases gave a growth chiefly of *B. coli*. The peritoneal cavity contained a large quantity of blood-stained exudate, the mesenteric veins were engorged, and although the intestine proximal to the strangulated loop was not distended, the total amount of fluid collected in the splanchnic area was very striking. Microscopic sections of the wall of the affected intestinal loop showed that the mucous membrane was almost completely destroyed, the cells being disintegrated and having lost their staining properties. If death were due mainly to absorption of toxic bodies from the strangulated loop, this must occur by one or both of two channels—namely, by the lymphatics from the loop or through the peritoneal cavity. In five animals I ligatured all the lymphatics as well as the veins from a portion of ileum isolated between two ligatures, but found that lymphatic obstruction did not affect the length

of survival of the animals to any appreciable degree. Absorption of toxic products, if it occur, must take place, therefore, mainly through the peritoneal cavity.

In six cases of venous obstruction I collected all the fluid from the peritoneal cavity, and injected it intraperitoneally into six other cats. In no case was there evidence of toxaemia, and all six cats survived. This, of course, only proved that there was not sufficient toxin in the peritoneal fluid at the time of death of the obstructed animal to produce symptoms on injection, and did not preclude a steady continuous absorption, the cumulative effect of which was sufficient to produce toxaemia and death. The content of the loop in such cases was next examined as to its toxic properties. It was found that the intraperitoneal injection of even small amounts of the unfiltered content produced rapid death from a virulent peritonitis and septicaemia.

In five cases the content of the loop was filtered through a Berkefeld filter, and then injected intraperitoneally into cats. In no case was there any marked evidence of toxaemia, and the animals all survived, although in three cases they lost weight considerably for several weeks after the injection.

In order to test what degree of toxic absorption may occur in the human being when a strangulated loop is allowed to empty its content into the intestine below, the unfiltered content from a venous obstruction loop was injected into the intestine of another animal above a simple obstruction of the ileum. This experiment was carried out on three cats. In spite of elaborate precautions to prevent soiling of the peritoneum, two of these animals died of a virulent peritonitis. The result in the third animal was very interesting: it showed no immediate toxic symptoms and lived for fourteen days—that is, slightly over the average duration of life for a simple obstruction.

I concluded, therefore, that whilst the content of a strangulated loop is highly infective, it does not cause toxic symptoms when absorbed through healthy intestinal mucosa, and that passing it through a Berkefeld filter removes any toxic bodies that it may contain as tested by intraperitoneal injection. The question then arose, Is death due to poisoning, not so much from the content of the loop as from absorption of autolytic poisons developed in the infarcted bowel wall itself? To test this question the affected loop in cases of venous obstruction, after being emptied of its content, was put into a hydraulic press and subjected to a pressure of 3,000 lb. to the square inch; the juice thus expressed was collected, passed through a Berkefeld filter, and injected intraperitoneally into cats. This experiment was carried out on five cats, but in no case did the injection cause more than a trifling and passing indisposition, all the animals recovering. I concluded, therefore, that poisoning by an autolytic toxin could play but a small part in causing death in such cases of obstruction.

In a fourth series of injection experiments I tested what was the effect of the combined injection of the three filtrates—that is, the peritoneal exudate, the content of the loop, and the pressure extract of the wall of the loop. This was tested in four cats; two of them recovered (one of these was definitely indisposed for forty-eight hours after the injection), the other two, although exhibiting no immediate toxic effects, died from peritonitis some days later, this being due to imperfect filtration of the fluids injected. Finally, to test whether there was any toxic body in the circulating blood of an animal during the later stages of a venous obstruction, I connected up the carotid artery of such an animal to the jugular vein of a healthy cat (50 c.cm. of blood having been previously removed from its saphena vein) and transfused the blood of the obstruction animal into the healthy one. On coming out of the anaesthetic the latter showed no evidence of toxaemia and made an uneventful recovery. The results of these experiments convinced me that toxic absorption from the strangulated intestine is not the primary cause of death in cases of internal strangulation, and whilst fully sensible that they did not exclude toxaemia as being a factor in many cases, they still pointed to shock and splanchnic paresis being the chief factors in producing the symptom-complex in cases of acute strangulation. This point was made especially clear in one experiment where, in an unusually large and powerful animal, the venous return from 50 c.cm. of small intestine was interfered with and this portion of bowel isolated by ligatures, the animal dying in five hours with typical symptoms. In this case cultures from the peritoneum were negative, as were also injection experiments with the peritoneal exudate, intestinal content, and the extract of the wall of the infarcted loop.

In cases surviving for more than twenty-four hours the factor of peritoneal infection comes in and may constitute the ultimate cause of death in such cases.

Conclusions.

1. Simple obstruction of the intestinal lumen must be clearly distinguished from strangulation. In the latter, death ensues long before the obstruction to the onward passage of intestinal content has become a factor of importance.

2. Simple obstruction high up in the intestine differs from that lower down, chiefly in the great loss of intestinal secretions by vomiting in the former, compared with the latter, where the secretions are reabsorbed above the obstruction.

3. Absorption of poisons from the content of the obstructed intestine is not the leading factor in producing the symptoms of acute ileus.

4. The danger of allowing the content pent up above an obstruction to flood the empty intestine below has probably been exaggerated.

5. Peritonitis plays no part in causing death in the majority of cases of simple intestinal obstruction; in cases of strangulation, however, it may undoubtedly be a factor in the later stages.

6. In all varieties of intestinal obstruction the bowel content is highly infective.

7. Splanchnic paresis with depletion of the systemic circulation is the main factor in producing the symptom-complex of acute intestinal obstruction. In treating this factor, besides the operative relief of the obstruction, copious subcutaneous infusions of saline and dextrose solutions are of immense value. Clinically, the administration of pituitrin is found to be a valuable adjuvant.

8. The prompt relief given by enterostomy in cases of simple obstruction of the small intestine in the human subject is to be explained, not so much by the relief from toxic absorption as by the breaking of a vicious circle, the intestinal distension causing a paresis of the splanchnic vessels, and vice versa. By relieving the intestinal distension the splanchnic vessels are allowed to regain their tone, and the depletion of the systemic circulation is arrested.

9. The operative treatment of intestinal obstruction should be as conservative as possible; only on imperative indications should the intestinal lumen be opened. The danger of a post-operative peritonitis from the slightest soiling is much greater than that of toxic absorption from a loaded bowel.

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RADIUM AND INOPERABLE CANCER.

By A. A. Warden, M.D.,

Paris.

The surgeon is a little apt, once he has committed himself to the opinion that a case of cancer is inoperable, to add that it will probably be best to attempt no treatment whatsoever. He has a wholesome disbelief in non-surgical measures, and classes among uncertain remedies Coley's fluid, radium, diathermy, etc. In other words, his attitude is orthodox and conservative, for the fiat has gone forth

that the only officially recognized treatment of cancer is the knife, and the knife as early as possible.

Now it seems to me that this phrase—that a cancer is inoperable—requires consideration, and perhaps some qualification. What is an inoperable cancer? Does the surgeon mean merely that in his opinion an operation is not advisable because likely to be followed by speedy recurrence, or does he mean that it is literally impossible, without undue risk to life, to perform any operation? From the patient's point of view the term "inoperable" may have a different meaning, for he may decline to submit to the vast mutilation that some surgeons still—and with good results in many cases to support them—feel themselves justified in recommending. For example, a patient has a small buccal or lingual cancer. The surgeon consulted thinks it quite operable, and suggests excision of the upper jaw or complete removal of the tongue. The patient declines, for he prefers, if necessary, death to such deformity. In other words, his cancer, to him, is inoperable—nor, indeed, can we blame his decision.

The term, therefore, does not seem to admit of strict definition, but must vary in its sense with the judgement and experience of each surgeon. Perhaps the simplest and least objectionable meaning to be attached to it would be that a cancer must be considered inoperable or operable in unfavourable circumstances when there is extensive glandular infection. Wide extension to glands of a cancerous process implies conditions of time and distribution that make it of very grave import.

If the cancer, then, be considered inoperable, is there any resource other than surgery, or is the outlook altogether hopeless?

Five years' experience has shown me that radium is worthy of recognition by every surgeon and physician who may be called to deal with an "inoperable" cancer. I ask the consultant surgeon not to confound inoperable with hopeless conditions, but to remember that radium-therapy, although in its infancy, has already proved its value in such cases. No reasonable man who takes the trouble to follow the records that have been published in different parts of the world can doubt that radium has won—next, perhaps, to the bistoury—the highest place in our therapeutic armoury.

In Paris, my friend Dr. Chéron and Dr. Rubens-Duval published last year a case of inoperable uterine cancer cured by radium. I use the word "cured" advisedly, for fifteen months later the patient died of a disease of the central nervous system, and the autopsy verified the clinical evidence of the complete disappearance of all cancerous tissue. Some details of this case were given in the *Lancet* of November 16th, 1912.

Ten further cases of uterine or vaginal cancer have been reported by these authors in which there has been, clinically, complete disappearance of the growth. Eight of these patients are alive and well one, two, and four years after the cessation of all treatment. These results are confirmed by Léjars, the well-known surgeon, and others.

I have had under my care a number of cases of advanced cancer—all so proved by microscopic examination—that have been known to exist for periods varying from nine to eighteen months, and that, accompanied by extensive glandular involvement, have rightly been considered inoperable. In almost every case the use of radium, alone or combined with surgical intervention on the glands, has resulted in the complete disappearance of the original tumour. Sometimes there has been no recurrence; the longest case in my mind, to which I shall refer more fully in a moment, is a squamous epithelioma of the mucous membrane of the lip under the care of Professor Gaucher and Dr. Dominici, inoperable, but well under radium treatment since February, 1908—that is, over five years later. Sometimes, although the initial lesion disappears, the glands can only be incompletely dealt with, and the patient succumbs to generalization. Sometimes, when a local cure has apparently been effected a metastatic growth in the vertebrae, or in an abdominal organ, makes its appearance. Sometimes there is recurrence, so-called, some months later, in contiguous tissue.

Considering that in these cases the radium has been applied after the cancer cells have been circulating in the lymphatic system for from nine to eighteen months, such results can scarcely be laid to the discredit of the therapeutic agent. It is possible no blame can be placed anywhere; but if there is any to be apportioned it is surely to the delay in the recognition of the cancer as finally inoperable, and in reaching the decision that the case is at last suitable for the radium expert.

It is surely evident that such reasoning is neither logical nor just. The squamous epithelioma of the mucous membrane of the lip, to which I refer above, occurred in a patient shown by Dr. Dominici and myself at a demonstration given before the Radiology Section of the British Medical Association in London in July, 1910. This patient (see photograph and special plate, British Medical Journal, August 27th, 1910) was treated in December, 1907, and was well in February, 1908, and now, in the spring of 1913, or over five years later, remains perfectly well with the mucous membrane of the lip completely restored and normal in appearance.

As I have referred summarily to what may fairly be termed a definite cure of cancer by radium, let me also give, as briefly as possible, notes of what might be termed a failure, in that, within the year, there has been "recurrence" or rather a fresh outbreak, close to the original lesion.

In May, 1912, a patient was sent to me to Paris by a distinguished London surgeon. He first had sore-throat with a definite pharyngeal lesion, not, however, then recognized as cancer, in March, 1911.

In October, 1911, glands enlarged on the left side of the neck, and, six months later, suppurated, were opened, examined histologically and found to be squamous epithelioma. The primary lesion, an ulcer situated between the epiglottis and the side of the pharynx, was then detected and other glands noted in the neck. On his arrival in Paris, therefore, we had to deal with a carcinomatous lesion of at least fifteen months' standing, inaccessible to surgery and complicated by extensive lymphatic infection.

In consultation with Drs. de Martel and Dominici our treatment was by a combination of radium-therapy and surgery. A platinum tube containing 40 mg. of radium was introduced into the base of the tongue through a small submental incision, and, after the anterior triangle of the neck had been cleared of the glands and cancerous tissue including part of the sterno-mastoid muscle, three other tubes were left to irradiate the tissues of the neck. These four tubes were removed thirty-six hours later. The wounds healed rapidly and, a month later, the complete disappearance of the tumour was certified by three eminent throat specialists, among them the authority who had originally discovered the lesion.

Nine months later the patient's condition remained excellent, and hopes of complete recovery were held by all familiar with the details of the case.

In April, 1913, that is, ten months after the treatment, further malignant processes were found in the throat—namely, ulceration the size of a sixpence, at the base of the tongue and along the left border of the epiglottis, an inch distant from the original lesion. Under cocaine the epiglottis was removed, and the microscope showed the cancer cells extending deeply into its cartilage. The lingual ulcer was dealt with by the introduction into the base of the tongue, through small lateral incisions in the neck, of two tubes of radium of 45 and 25 mg. A month later the most careful search again failed to detect any sign of malignant disease, and the patient is to-day in full enjoyment of his usual strength.

Even admitting such a case to be, however, a failure in that recurrence took place, it may justly be claimed for radium:

1. That the original tumour disappeared.
2. That the neck remains free from evidence of lymphatic infection; and
3. That the patient is still enjoying healthy activity a year after a hopeless verdict had been pronounced, and more than two years after the first evidence of cancer.

CHRONIC INTERSTITIAL ENTERITIS.

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I have pleasure in drawing your attention to this condition, which, I think, has not yet been fully described.

Twelve years ago I saw a professional colleague, suffering from obstruction of the bowels of a fortnight's duration.

previous to which he had had for several weeks numerous attacks of colic, slight attacks of diarrhœa with no tenderness over the abdomen, and very slight rise in temperature, with no appreciable alteration in the pulse-rate. When seen by me the abdomen was not distended nor were the muscles rigid, but to the hand gave a sense of putty-like resistance. As vomiting was persistent, I concluded that there might be an obstruction high up, and so opened the abdomen, to find the whole of the intestines, large and small alike, contracted, rigidly fixed, so that when a loop was lifted from the abdomen it sprang back into its sulcus. That the wall of the whole intestine was chronically inflamed there was no doubt. In parts the peritoneum seemed œdematous, as was also the omentum and mesentery, in which the glands could be felt enlarged. Nothing could be done to restore the function of the canal, and the patient died a few days afterwards.

We were not then familiar with the condition, and it was supposed to be tuberculous, though this was negatived by microscopic examination, the only information we obtained from the pathologist being that the condition was a chronic and inflammatory one. A few years later, with Dr. Gibb of Paisley, I saw an exactly similar condition in a young man of 32. His symptoms were somewhat more acute than the previous case, but practically the same. He also died. No examination was allowed.

In these two fatal cases the disease involved the whole of the small and large intestines. The following cases being localized, and therefore excisable, permitted operation, and excision of the affected portion was in all cases followed by complete restoration to health.

The first of these cases I saw with the late Professor Gemmell in 1905.

Mrs. T. was admitted to the Western Infirmary with symptoms of partial obstruction, and one could palpate a coil of intestine, rigid and thickened. Treatment was of no avail, attacks of pain becoming more frequent; progressive emaciation and general malaise led to operative interference, when a portion of jejunum over 2 ft. in length was found to be affected and was excised, with perfect recovery. I removed in two cases the caput coli and adjoining portion of the ileum.

In another case the sigmoid, and in another the transverse colon, and, lastly, from a child of 10 a specimen which well now indicates the great thickening of the bowel wall. This specimen was from the middle of the ileum.

The following is the pathological report of the condition from the laboratory in the Western Infirmary, on the specimens obtained from the ileum, jejunum, and colon.

Pathology.

Histologically there is much in common in the three cases, indeed they form a graded series in which all the stages from acute to chronic may be traced. The most acute lesions are found in Master W. G., and the most chronic in Mrs. N. The following description is based upon a study of numerous sections from each case.

The earliest change in the bowel appears to be that of acute congestion. The vessels throughout are dilated, and there is much œdema of the submucosa. As evidences of the acute inflammation, the vessels are seen to be rich in polymorphs, and there is considerable infiltration of all the coats with similar cells. Here and there, too, in mucosa and submucosa irregular haemorrhages have occurred. These changes also implicate the mesentery in a lesser degree. It is noteworthy that the lymphoid aggregations are singularly free from pathological change.

With increasing infiltration the next phase arises, namely, cellular and fibrinous exudation within the gut lumen (bile-stained naked eye). Still later the mucous membrane is denuded of epithelium, and, the muscularis mucosæ being obscured by infiltration and necrosis, the appearance is that of a few islets of glandular tissue lying in a semipurulent collection which abuts upon the much altered submucosa. There is, however, no great sloughing of the bowel wall, and the muscle is not laid bare, indeed it is in a way protected, as shown by a new formation of capillaries in the more superficial layers of the submucosa.

In the specimen from Mrs. T. the regenerative process is in the ascendancy, although the condition is still fairly acute. The serous and muscular coats are slightly œdematous, markedly congested, even slightly haemorrhagic, and considerably infiltrated with both polymorphs and mononuclear cells. The submucosa is also œdematous and infiltrated, mononuclear cells, however, predominating. The muscularis mucosæ is definable as the outer limit of a broad zone of young granulation tissue which is evidently replacing the now thin layer of purulent exudate within the gut lumen.

A still further advance in the healing process is seen in the sections from Mrs. N. There is scarcely any purulent exudate within the lumen, it and the mucosa having been replaced by granulation tissue in which the vessels are numerous and well formed, and fibroblastic transformation is well marked. There is less œdema of the tissues than in the two previous cases, and though leucocytic infiltration of all the coats is still great, it is definitely a mononuclear one. Further, there is a notable number of eosinophiles throughout, and a few giant cells are also present in the granulation tissue.

From the acute case, Master W. G., coliform bacilli were isolated in pure culture from the depths of the affected bowel wall under circumstances which suggest an etiological relationship. They are also demonstrable in suitably stained sections.

A careful search has failed to reveal micro-organisms of any kind in the depths of the other two cases—the ordinary bacterial flora of the gut alone visible in the most superficial part of the exudates. The symptoms in all the cases were similar; the characteristic and most striking feature being most violent colic, causing vomiting and occasionally an escape of some blood, also constant mucus from the bowel. The bowel becoming exhausted, or the contents being forced through the rigid portion, the patient then would be at rest, quite comfortable and cheerful for a time. In the case of the child even ten or twelve hours might elapse between the attacks of pain, which were truly distressing in their intensity. In the young one would naturally suspect intussusception, except that the obstruction was not complete, while the intensity of the pain put a chronic intussusception out of the question. Above the affected portion of the bowel peristalsis could be observed. During a painful attack the inability to retain food and the constant suffering leads to steady emaciation, the temperature only occasionally rises and during the intervals of pain, and the pulse is quiet. In all the cases one could determine an area of resistance in the colon and sigmoid, naturally giving rise to the supposition that we might have to deal with a diffused and malignant growth. As far as I am aware, the prognosis is bad except in cases where the disease is localized, and even there seems rather hopeless unless operation be had recourse to.

Etiology.

In regard to etiology, we have no direct clue by histological or pathological examination. The cases gave the impression that they were probably tuberculous, and yet from the uniform character of the affection it evidently is not so. The affected bowel gives the consistence and smoothness of an eel in a state of rigor mortis, and the glands, though enlarged, are evidently not caseous.

In vol. xx of the *Journal of Comparative Pathology and Therapeutics*, McFadyen draws attention to Johne's disease, a chronic bacterial enteritis of cattle which was called pseudo-tuberculous, in which the histological characters and naked-eye appearances are as similar as may be to those we have found in man. The condition was first described by Henny and Frothingham in 1895, since which time numerous observers have noted its course in various parts of the Continent, and McFadyen examined 6 cases found in England in 1911. McFadyen, however, describes an acid-fast bacillus similar to but demonstrably not the tubercle bacillus, differing in size, and also as not giving rise to tuberculosis in guinea-pigs. This bacillus is found not only in the tissues but also on the surface of the mucous membrane, which in animals seems to be more affected, presumably because they die earlier, than in man, so that the disease is not so advanced. In my cases the absence of the acid-fast bacillus would suggest a clear distinction, but the histological characters are so similar as to justify a proposition that the diseases may be the same. As far as I know the disease has not been previously described, but it seems probable that many cases must have been seen and have been diagnosed as tuberculous, and possibly nothing done for their relief.

Treatment.

In regard to treatment, these cases which have come under observation have pursued their course uninfluenced by dietetic or medicinal treatment, and apparently only operation can afford relief, and then only if the disease be limited. Seven out of the nine made a perfect recovery after the operation, and one does not hesitate in resecting large portions of the intestine. The subject has been one of great interest to me for some years. My friends the pathologists prefer to call it hyperplastic enteritis, and I can only regret that the etiology of the condition remains in obscurity, but I trust that ere long further consideration will clear up the difficulty.

Another specimen I obtained recently from a patient of Dr. Revie of Kilmarnock.

A lady on whom I had performed colostomy on the right side a year previously, with the object of arresting the intestinal current to enable us to freely flush the diseased colon. The symptoms were those already described with an exaggerated degree of pain, and persistent, most painful diarrhœa with blood and mucus. Distinct improvement ensued from the colostomy and lavage, though during the year she had on two occasions exacerbations. When seen at the end of the year she had been extremely ill again for one month, and was so evidently losing ground that I advised complete removal of the colon, which colon shrunk to its present dimensions as I now show you. The histological characters are similar to those found in the previous specimens. The patient has made an uninterrupted recovery so far, and I hope at no distant date to transplant her caput coli (which alone was unaffected and was left) to her rectum.

An interesting fact in this case is that on the removal of the colon it was immediately sent in a sealed vessel to the pathologist, and he failed to discover micro-organisms either on the surface of the mucous membrane or in the tissues, indicating that lavage had been thoroughly effective in purifying the canal, in spite of which lavage, however, the disease had steadily progressed. Indeed, from the first operation the disease had extended upwards from below the hepatic flexure to near the caput coli.

DISCUSSION ON THE DIAGNOSIS AND TREATMENT OF INJURIES OF THE KNEE-JOINT OTHER THAN FRACTURES AND DISLOCATIONS.

OPENING PAPERS.

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In the first place I must thank the President and Council of the Surgical Section for the honour they have done me in asking me to introduce the discussion on the diagnosis and treatment of injuries to the knee-joint other than fractures and dislocations. I can assure you it is an honour I greatly appreciate, and I sincerely trust that the subsequent discussion will prove both interesting and profitable.

It has been somewhat difficult for me to decide upon the form in which I should treat the subject, but, after considerable thought, I have come to the conclusion that the clearest and best method will be to exclude such conditions as perforating wounds and their effects, and confine myself to what one might term subcutaneous injuries. Among these are simple traumatic synovitis and arthritis, more or less severe lacerations of important ligaments, haemophilia, some forms of loose bodies, injuries, sometimes trivial, to joints already affected with disease, such as osteo-arthritis and torn semilunar cartilage.

Anatomy.

Before considering these injuries seriatim, I think it would make the subject clearer if I briefly mentioned some of the more important features in the anatomy of the knee-joint, particularly those which have a bearing on my subsequent remarks. This joint, besides being the largest, is the most complicated articulation in the body, and possesses important extrinsic and intrinsic ligaments. Included in the former are the anterior or ligamentum patellae; the internal lateral, which is a broad, flat structure; the cord-like external, and lastly, the posterior. The chief intrinsic ligaments are the anterior and posterior crucial. Also contained in the joint, and in close relationship to the articular surface of the upper end of the tibia, are the two important semilunar cartilages. These are two crescent-shaped pieces of fibro-cartilage, the internal being applied to the upper surface of the internal and the external to the upper surface of the external tuberosity of the tibia. The internal forms a larger segment of a circle, and is less movable than the external. Its posterior end is attached to the back part of the intermediate rough area on the upper end of the tibia in front of the attachment of the posterior crucial ligament, and the anterior end is attached to the front of the intermediate rough area just in front of the anterior crucial ligament. Its circumference has a firm attachment to the deep surface of the internal lateral ligament, and a somewhat weak connexion, by means of the coronary ligament, to the upper end of the tibia. The external cartilage forms a smaller segment of a circle than the internal, and takes up a smaller space. Its anterior extremity is fixed to the intermediate rough area in front of the tibial spine, while its posterior end is connected to the tibial spine between the two tubercles, giving a strong slip to the posterior crucial ligament. It has no attachment to the external lateral ligament, being separated from this by the tendon of the popliteus muscle, but it has a weak connexion with the upper end of the tibia by means of the coronary ligament. The external semiluna cartilage therefore has a decidedly looser attachment than the internal, and this circumstance, as I will show later, is the cause of the greater frequency of tears or splits of the internal semilunar cartilage.

The knee is not a simple hinge-joint, as at the end of extension and the beginning of flexion there is a distinct twisting movement of the femur on the tibia. This is brought about by the fact that the articular surface of the internal condyle is longer by a third than the corresponding surface of the external. Thus, in the movement of extension, following upon acute flexion, after the articular surfaces on the external and posterior two-thirds of the internal condyles have glided over the corresponding parts of the articular surfaces of the tibia, any further movement must occur in the anterior oblique third of the internal condyle. In consequence, this condyle twists or screws inwards, and at the end of extension the joint is securely locked. Thus, the femur and tibia become practically one continuous rigid support; no lateral or rotatory movements being possible, and the following ligaments—namely, the internal lateral, anterior crucial, and posterior—become taut and tense. When, however, flexion takes place, a certain amount of rotation and lateral mobility is possible, varying in degree with the amount of flexion. Whereas, therefore, in the case of a fully extended knee-joint, no rotation is possible, except there be tearing or stretching of important ligaments, in the case of the flexed position a certain amount of rotation and lateral movement is possible, and hence there is greater insecurity. It is in this flexed position that tearing or splitting of the semilunar cartilage takes place.

In a paper which I read on October 8th, 1912, before the Royal Society of Medicine, after stating that the occupation of coal-mining far outnumbered all others, in the district of Northumberland and Durham, in supplying the vast majority of sufferers from this accident, I mentioned that the coal-miner, owing to the lowness of the seam at which he is hewing, performs his work with his knees more or less flexed—in a position, therefore, in which a certain amount of rotation and lateral mobility, between the upper end of the tibia and the lower end of the femur, is permitted. If, while the knee is in this position, a forcible twist or wrench takes place, the semilunar cartilage, nipped between the condyle of the femur and the upper end of the tibia, may be forcibly dragged towards the centre of the joint, and either split more or less in a longitudinal manner, or have its free edge torn or frayed.

This conclusion, which was based upon a personal experience of 419 cases in which operation had been performed, and in which great care had been exercised in taking the history of the patients, is, I am aware, directly contrary to that of Mr. Albert Walton, who is of opinion that forcible extension is the cause. I may mention, however, that his opinion is based mainly upon anatomical grounds and experiments on the cadaver.

I would here urge that in all cases of injury to the knee-joint accurate inquiry should be made into the story of the accident and the subsequent history, as, when the

patient comes before the surgeon, most probably no objective symptoms, beyond perhaps the presence of fluid in the articulation, are present, and to gauge the extent of any intra-articular lesion you are compelled to depend on the answers given to your inquiries.

Under the term "traumatic synovitis" I am including those cases in which, after injury, there is an acute effusion of more or less extent into the joint, but no extensive injury to any of its ligaments or to the semilunar cartilages; consequently the stability of the joint is not in any way permanently affected. It is true that in a large effusion, with consequent stretching of ligaments, some lateral mobility of the joint in the extended position is possible, but when the effusion has disappeared this disappears also. If simple acute synovitis be treated immediately after the accident by rest, and perhaps by the application of cold, the condition quickly improves, and when pain and tenderness have subsided, moderate exercise should be encouraged to aid in dissipating the effusion. In some few cases the effusion becomes chronic, but when this occurs elastic pressure with moderate exercise will, as a rule, effect a cure.

Where there has been extensive injury to the important ligaments accurate diagnosis is very important, as in the absence of this correct treatment will be impossible, and the result will be probably a very much weakened articulation. Probably the most common is that in which, in consequence of forcible hyperextension, rupture of the posterior, back of the internal lateral, and anterior crucial ligaments has occurred.

In April, 1911, in an important League match under Association Football rules, a famous centre-forward, after beating the opposing backs, was making for goal with the ball at his toes. The goal was apparently at his mercy, when the goalkeeper rushed out, fell on to his knees, and endeavoured to pick up the ball. In doing this he "chocked" the forward's right knee, and prevented it being bent. As a result, the body momentum going onwards, and the knee being incapable of flexion, a large degree of hyperextension took place, leading to extensive tearing of the ligaments normally preventing this. I possess an instantaneous photograph, taken at the psychological moment, which aptly illustrates what actually occurred.

When I saw him, a few minutes after the accident, he was in extreme pain, the knee-joint was very much swollen, and hyperextension was possible to an angle of 45 degrees beyond the normally fully extended position. An *x*-ray photograph showed that there was no injury to the bone. He was treated by splinting the injured knee in a slightly flexed position for three weeks, and during this time he was confined to bed. He was then allowed to get about on crutches, the limb being encased in poroplastic splints and the joint still kept in the slightly flexed position. After three months had elapsed, passive movements were cautiously commenced. Necessarily, of course, treatment was both prolonged and tedious, but in the end a good result was attained, sufficient to allow him to return to first class football.

In other cases, in consequence of forcible abduction or adduction, tearing of the external or internal lateral ligaments respectively may result, and, if proper repair does not take place, a weakened joint, with abnormal lateral mobility, will certainly eventuate. This result probably is not so liable to happen where the internal lateral ligament is the one affected, seeing that it is a broad structure, and therefore possesses more chance of uniting. It would seem almost certain to take place where the external lateral ligament has been torn, as this is narrow and cord-like, unless operation be carried out and the torn ligament sutured.

I have had several cases of recently ruptured internal lateral ligament in which abnormal lateral mobility was a prominent feature, but none in recent years. These cases were all treated by splinting over a prolonged period, but in no case was a really good result procured. If I were to meet another case I should unhesitatingly expose the injured ligament and bring together the torn edges with chromic catgut sutures.

The anterior ligament, or the ligamentum patellae, is sometimes torn. In a certain number of cases no doubt it has resulted in the same way as an ordinary transverse fracture of the patella, and in others it has occurred in consequence of sudden and forcible flexion of the knee joint.

Where such an accident has taken place, there is inability to extend the leg on the thigh, the patella is displaced upwards, and a gap is felt in the position of the patellar tendon. There may or may not be an effusion into the joint. The treatment to be recommended is, I think, primary suture of the torn ligament with chromic catgut or fine silk sutures, followed by rest in the fully extended position for at least eight weeks. At the end of this time splints may be discarded, but full flexion should not be allowed for a further two months. My colleague, Mr. Angus, has recently had two examples under his care. In both the cause was acute flexion, and in both primary suture with chromic catgut was used. In each case an excellent result was obtained.

To sum up the treatment, then, of recent rupture of these important ligaments, where forcible hyperextension has been the cause, I would recommend splinting in a slightly flexed position for twelve or more weeks, followed by massage and exercises. Where the internal lateral, external lateral, or anterior ligaments are torn, I think the best treatment is primary suture.

I have several times been consulted by patients who possess knees which are capable of being abnormally hyperextended, and which have resulted from severe injury some time previous. There is no difficulty, at any rate, in concluding that one of the crucial ligaments, or both, have been torn, but what ought to be recommended under these circumstances is a serious problem. My colleague, Mr. Rutherford Morison, has endeavoured to replace the damaged crucial by one of the semilunar cartilages, but with no success. Personally, in such cases I advise the patient to content himself with wearing a properly fitting knee brace.

The subject of haemophilia is a very interesting one, but may be dismissed in a few words. Children or young adults the subjects of haemophilia, on very slight injury to the knee develop haemorrhages of more or less amount in the articulation. In consequence swelling of the joint occurs. In the first attack or two the condition will probably readily be recovered from, and the parts may regain their normal condition. Subsequent attacks, however, result in degenerative changes taking place in the joint, leading to thickening of the synovial membrane and fibrillation of the articular cartilage. In consequence more or less permanent swelling of the parts remains, and ankylosis, more or less complete, is likely to result. Such cases may be mistaken for tuberculous or syphilitic disease, but consideration of the family and previous history will prevent error in diagnosis.

With regard to treatment, all that can be recommended is to warn a haemophilic patient to avoid injury as far as possible. If haemorrhage has already occurred into the knee, then rest in bed must be enjoined for a prolonged period, and ice applied to the injured part. Incisions and even explorations by a hypodermic needle must not be used.

Loose Bodies.

Some forms of loose bodies in the knee-joint undoubtedly result from accident or injury. During the past twelve years I find I have had a personal experience of 25 cases of loose bodies of all sorts. In some of these a history of definite injury was obtainable. In one case the body was found to be a small piece of articular cartilage; in another case it was found to be composed of fibrinated blood clot; while in 2 cases it was found to be composed of a portion of semilunar cartilage which had become detached in a way which I shall show you later, when I describe the different forms.

In 3 cases upon which I have operated on the assumption that they were suffering from torn semilunar cartilage, I found, on opening the joint, a remarkable condition of affairs. In the synovial fluid were a number of white flakes, their appearance suggesting thin slices of cartilage. For some reason or other no microscopical examination was made in the first two cases, but in the third—which only came under my care some days ago—I sent a flake to Professor Stuart McDonald. He reports definitely that it is fibro-cartilage, and therefore of the same structure as a semilunar cartilage. An interesting feature of the same case was that on the under surface of the semilunar cartilage a small thin shaving of its substance was stripped up. It was easy to imagine its complete detachment, becoming then one of the loose flakes before mentioned. In all three cases there had been repeated attacks of pain and swelling following upon a twist, and a prominent physical sign was marked crepitation on flexion and extension movements.

I have met with several cases where the loose body was composed of bone covered by articular cartilage, but as in these fracture of the subjacent condyle of the femur had occurred they would be beyond the scope of this discussion. The symptoms which arise from loose bodies in the knee-joint may at first be somewhat obscure, but later, as a rule, present no difficulty in diagnosis. They result from the body becoming engaged between the joint surfaces during the movement of extension. In this way the ligaments are stretched and perhaps even torn, thus giving rise to the pain complained of by the patient. A common history is that, while the patient is walking or running, he feels something slip in the knee, and a sudden pain is experienced in the joint, generally at the inner or outer side. He then finds that he is unable momentarily to fully extend his knee. In some cases the inability to completely extend the joint remains until the body is removed, but this can only happen when the body is large and wedged between the patella and the condyles. In at any rate the earlier attacks these symptoms are followed by an effusion into the knee-joint, which disappears in the course of a week or ten days. At first the patient is probably unable to feel the body, although at times he may be conscious of something moving about the articulation. Later there comes a time when he is able to feel it and perhaps demonstrate it to the surgeon. I have known sufferers from this condition, after the surgeon has persisted in a search lasting over several minutes, flex and extend the joint several times, simultaneously pressing with their thumbs round the patella, quickly locate the body, and fix it. These bodies are very elusive, and easily slip away into some inaccessible part of the articulation on the slightest pressure, and on this account the Germans have quite appropriately named them "joint-mice." A curious feature of the loose body is that on pressing it the patient complains of severe pain.

If loose bodies give rise to trouble the only treatment is removal. This must on no account be undertaken until they have been located and fixed in some accessible part of the joint. My own plan is not to use a general anaesthetic, as while the sufferer is being placed under its influence the body may slip away. After thorough cleansing of the skin surrounding the joint I fix the body by thrusting a hare-lip pin, or some such thing as a darning needle, through the skin into it, and next inject a few drops of weak eucaine solution in the line of the proposed incision. Then after opening the joint there is no difficulty in removing the troublesome agent. I need hardly say that strict aseptic precautions must be carried out previous to operation, otherwise a disaster may occur, as is shown in a case in which, a few years ago, I had to amputate the leg of a young man on account of acute septic arthritis of the knee-joint following upon the removal of a loose body by a doctor in his surgery, no aseptic or antiseptic precautions being used.

Injuries to Joints Affected with Osteo-arthritis.

Traumatic osteo-arthritis is looked upon by many surgeons as a definite pathological entity, but I am by no means convinced that such is the case, rather am I inclined to believe that such are cases where injury has aggravated a joint already affected with osteo-arthritis. I have, of course, encountered patients where, after a knee has been more or less severely twisted or contused, and particularly if these injuries have been frequent, signs of osteo-arthritis have been discovered; but in the large majority of such cases, on examining the opposite knee, signs of the same disease will probably be found, though generally much less marked.

One commonly meets patients who present definite signs of osteo-arthritis in their knees, signs such as crepitation on movement, lipping of bone, etc., and yet who complain of no symptoms and are able to work regularly and well. They then receive an injury, more or less severe, to one or other knee, and from that time complain of symptoms—such as stiffness, feeling of insecurity, and pain on walking or standing—for a long while. In many cases the injury is not a severe one, and would have been easily and quickly recovered from had the joint been healthy.

Changes in the knee-joint similar to those of osteo-arthritis are frequently met with in old people, and in all probability are of the same pathological nature. In these cases a comparatively slight injury has a similar effect as in the joints affected with osteo arthritis, and very often results in, especially where prolonged rest has been used, a painful and ankylosed articulation.

In these osteo-arthritic patients, after an injury such as a twist or wrench, symptoms similar to those of torn semilunar cartilage are complained of. Even at the time of the accident the patient may experience a click at the inner side of the joint, and inability to completely extend the articulation is also found. I have operated upon several such cases, and, beyond finding signs of osteo-arthritis, have never noticed tearing of the semilunar cartilages. In textbooks and elsewhere it is stated that the cause of the symptoms is probably nipping of a hypertrophied synovial fringe. Personally, however, I have not found this to be the case. Where I suspect that a joint is affected with osteo-arthritis I hesitate to advise operative interference, unless it be for the purpose of removing a loose body, such as might be formed of a piece of hypertrophied synovial fringe, portion of articular cartilage (which in this disease becomes very brittle), or an osteophytic outgrowth. The treatment I would recommend consists simply of rest to the injured joint until pain and tenderness have subsided; then carefully graduated passive and active movements are instituted together with hot douches and massage.

Injuries to joints affected with such a disease as tubercle, either latent or active, have also to be mentioned. In the former case the disease may become active again, but in any case treatment does not differ from that ordinarily used for tuberculous disease affecting a joint.

Injuries to Semilunar Cartilages.

I now come to probably the most interesting condition which will properly come within the scope of this discussion, namely, injuries to the semilunar cartilages.

In the Royal Victoria Infirmary, Newcastle-upon-Tyne, the hospital to which I am attached, these accidents are frequently met with. This institution receives patients from the whole of the northern counties, a district in which coal-mining forms one of the largest, if not the largest, industries. In these mines the seams of coal are, as a rule, low, and in very few instances exceed 4 ft. or 4 ft. 6 in. in thickness. The mine-worker, therefore—and this applies not only to the coal-hewer but to all underground workers—is seldom able, when once below bank, to adopt a position in which the knees are fully extended. In the great majority of cases they work in the squatting position or sit on a low stool. Their knees, therefore, are in a position in which a certain amount of lateral mobility and rotation is possible, a position which, I have before pointed out, conduces to rupture or tear of the semilunar cartilages.

I would here emphasize that in the large majority of cases definite splitting or tearing occurs, this being brought about, I think, by the inner circumference of the cartilage being nipped between the condyle of the femur and the tuberosity of the tibia, and then, in consequence of a sudden twist, being forcibly dragged towards the centre of the joint.

The internal semilunar cartilage is much more commonly torn than the external. I find that up to the end of March last I have operated upon 509 cases, of which only 38 have been external; this gives a percentage of 7.5. I think perhaps the reason for the greater frequency of internal semilunar cartilage tears or ruptures is to be found in the existing anatomical conditions. The external semilunar cartilage has a much looser connexion than the internal, consequently, supposing it became engaged between the external condyle and the upper surface of the external tuberosity of the tibia, and is then dragged towards the centre of the joint, stretching of its connexions rather than splitting of its own substance would be more likely to result. In the case of the internal semilunar cartilage, which has a close connexion with the internal lateral ligament and the capsule, a tear would be more likely to occur under the same circumstances. As a rule, the injury will be found in the anterior part of the semilunar cartilage, and therefore, on the joint being opened, is readily seen. Where it is in the posterior part, unless care be exercised, it may be easily overlooked.

Probably the commonest type of torn semilunar cartilage is that in which there is a split which extends for a variable distance from before back. This split varies in position, being sometimes quite close to the attached border, and in others near the free edge; but in all cases there still remains a portion of cartilage retaining its normal attachments (see Fig. 1). When the accident is recent the edges of the tear are rough, and may even be blood-stained. In old cases, on the other hand, the edges of the tear become rounded, and cicatrization may even be noticed at either end. The detached portion, on opening the joint, may still occupy its normal position, and unless careful scrutiny be made, may be overlooked. In the great majority of cases, however, it will be found displaced towards the centre of the joint, and under these circumstances is easily recognized, being practically only attached to its anterior and posterior ends (see Fig. 2). Where the split is situate in the posterior part it can only be demonstrated when the anterior part of the cartilage is divided and strongly dragged upon, and on this being done, the detached portion suddenly snaps forward.

In another type the tear extends from some point in the free edge across the cartilage, then forwards or more rarely backwards for a variable distance, thus giving rise to a pedunculated piece, which may readily become engaged between the condyle and the corresponding articular surface of the upper end of the tibia (see Figs. 3 A and 3 B). This pedunculated piece after a time, and in consequence of being frequently ground between the articular surfaces, becomes rounded and of a discoid shape (see Fig. 4). In some examples its attachment to the rest of the cartilage becomes very slender, and, no doubt in consequence of further trauma, it may become completely detached and form a variety of loose body (see Fig. 5). In others the loose piece—possessing quite a wide arc of movement, but still retaining an attachment to the cartilage from which it has been torn—slips out of the joint and can readily be felt in front of the condyle (see Fig. 6). I might add that it is only under these circumstances that, previous to operation, the torn piece can be seen or felt. In a case recently operated upon the transverse tear did not extend through the whole thickness, but only across the superficial fibres, which were also torn forwards for an inch, thus forming a pedunculated piece, which at times gave rise to trouble.

In a few specimens I have found that the under surface only has been split.

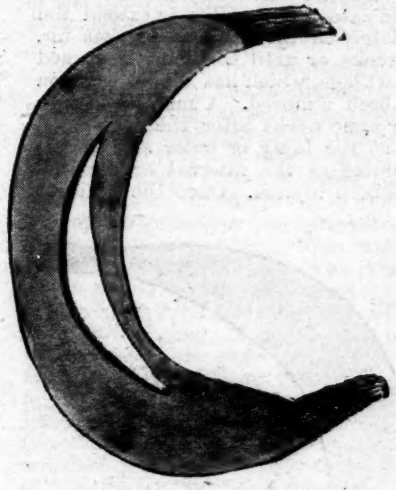

Fig. 1.

Fig. 2.

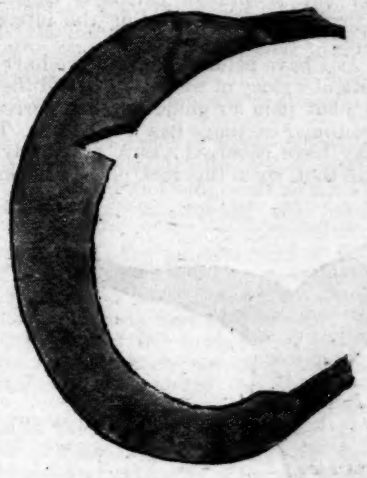

Fig. 3A.

Fig. 3B.

Fig. 4.

Fig. 5.

Definite injury, amounting to fracture of the articular cartilage, may be caused by sudden extension movement of the knee while the detached piece of semilunar cartilage is engaged between the joint surfaces.

A short time ago I operated upon a man who, eighteen months previously, had severely twisted his right knee in consequence of his right foot slipping on a banana skin. At the time of the primary accident he experienced very severe pain at the inner side of the joint and also felt something crack in the same situation. He fell to the ground, and on rising his knee was locked, and could not be extended beyond semiflexion. He hobbled home, and shortly afterwards was seen by a bonesetter, who made forcible attempts at extension, and in the end seems to have succeeded, as after the efforts this movement could be effected, and he was able to walk about much more comfortably. Since this time he has had several attacks of pain of much the same character as the first, only much less

severe. A week previous to being seen by myself he twisted the same knee while getting out of bed. The same signs and symptoms resulted, and, previous to operation, he was still unable to completely extend the joint. I found, on opening the articulation, that the internal semilunar cartilage had been torn across about its middle, then split forwards, the loose portion lying in the joint. On the under surface of the internal condyle towards the intercondyloid fossa, and with its attached edge towards this fossa, was a semilunar tear in the articular cartilage. This included a piece of cartilage which could easily be lifted forwards, and had no doubt been caused by the torn piece of semilunar cartilage becoming interposed between the articular surfaces of the internal condyle and internal tuberosity of the tibia, and then sudden extension taking place (see Fig. 7). In another case the torn piece of an internal semilunar cartilage caused splitting of the articular cartilage covering the internal tuberosity of the tibia.

As I have before indicated, we have to depend upon the patient's story of the accident and the subsequent attacks of joint pain to guide us to a correct conclusion that a semilunar cartilage has been torn. The original accident may have occurred years previously, and we are often told that, since this took place, attacks of pain in the joint have occurred on more or less slight provocation, such, for instance, as walking on uneven ground, slipping on a greasy pavement, rising from the squatting position, etc. Seeing that the condition is most frequently met with in miners, it will perhaps be advisable if I indicate how the accident often occurs in the course of their occupation. A man in a squatting position is casting coals from one side into a tub; the body swinging round too far causes the knee to be forcibly twisted inwards or outwards. Again, while hewing in the squatting position the same thing may occur; or, again, while walking in the stooping position with the knees flexed he may get his foot fixed in a hole, the corresponding knee becoming twisted and the cartilage torn.

Football players are, next to coal-miners, the most frequent sufferers from torn semilunar cartilage, and the accident is brought about, very often, in the action of swerving or dodging. Here, one foot being firmly fixed in the ground, in consequence no doubt of the long studs in the player's boot, and the body momentum going on, the knee on the same side becomes violently twisted. Again, in some cases, where the ball is about to be kicked, say with the right foot, but instead is missed or miskicked, the left foot being fixed in the ground and the body momentum swinging round, the same knee may become twisted and the cartilage torn. I would here mention that I have never known the accident result in consequence of a direct blow.

However the accident happens, the first symptom is very severe pain, which is often primarily felt over the whole joint. Later it becomes localized to a point at the inner or outer side, according as the inner or outer cartilage is injured, and may be so excruciating as to cause faintness and vomiting. Simultaneously, a click or a snap is felt in the same situation, and, as a rule, the patient falls to the ground. In the majority of cases, the joint is incapable of full extension, and feels absolutely helpless. One is frequently told that it is only after the joint has been flexed and extended several times, probably by a fellow-worker, that the movement of full extension is restored. When this takes place, the pain is very much lessened, and, in many cases, the patient is then able to hobble home. In a few hours marked swelling of the joint occurs, the result of effusion into it, and this, in consequence of treatment, disappears in the course of two or three weeks. In certain cases the inability to extend the joint following immediately on the accident persists for, may be, two or three weeks, or until the joint is opened and the torn piece of cartilage, which has slipped between the joint surfaces, has been removed. A marked feature of any case is that for some weeks after the accident a tender point remains at the inner or outer side of the patella ligament, according as the internal or external semilunar cartilage has been injured. Once the accident has occurred, it is probable that subsequent attacks of joint pain and disability will occur, and these may result from very slight causes. I have known such an attack be brought on by catching the toes in the bed clothes or slipping on a banana skin; moreover, it may occur at very awkward times, as, for instance, while crossing a road or street in which there is a large amount of traffic.

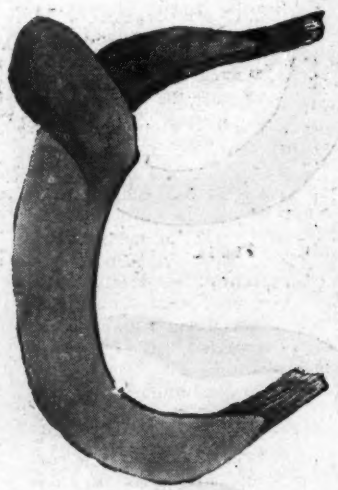

Fig. 6.

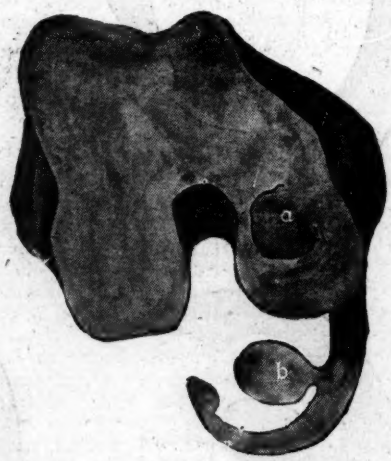

Fig. 7.—*a*, Tear in articular cartilage caused by a pedunculated piece, *b*, of internal semilunar cartilage torn from anterior portion.

Fig. 8.—*a*, Healed transverse tear; *b*, pedunculated piece torn from posterior part of cartilage.

Whereas after the primary accident pain and swelling are very prominent features, in subsequent attacks these often become much less marked. Frequently an attack will consist of little more than experiencing pain at the inner side of the knee, and a click or snap in the same situation. The joint is then found to be locked in a more or less flexed position, and remains so until, while the knee is being moved, another click or snap is experienced, and it is found that full extension is possible. These attacks occur more or less frequently, and, where they have been often experienced—owing, no doubt, to increased tolerance—may be followed by no effusion in the articulation, but invariably on examination a tender spot will be found at the inner side of the patella tendon.

When a clear history, such as I have described, is obtainable, there will be no difficulty in coming to the conclusion that a torn semilunar cartilage is the cause of the symptoms. In some cases of loose body, however, especially just after the first attack of joint pain, there may be some difficulty in coming to a correct diagnosis; but in these, unless the body be of large size and wedged between the condyles and the patella, the locking is only

momentary. Again, in almost every case of loose body there comes a time when it can be actually felt, and in these circumstances no mistake can be made. Perhaps the condition for which a torn semilunar cartilage is most frequently mistaken is osteo-arthritis. Patients suffering from this disease, after twisting a knee, may complain of pain which was previously not noticed, or at least was not a marked feature, and the pain is often referred to the inner side of the joint, just in the position where it is present in the case of a true tear of the semilunar cartilage. Moreover, inability to extend the joint may be a prominent feature, and a tender point at the inner side of the joint is frequently demonstrable. As a rule, however, it is comparatively easy to distinguish between the two, if sufficient care be taken. In the case of the osteo-arthritis, the patient is beyond middle life, there is crepitation on moving the joint, and there may be actual lipping of the articular ends of the bones. Again, the other knee may present definite evidences of the disease.

Treatment.

With regard to the treatment of torn semilunar cartilage, the question arises as to whether in a recent case healing may take place with appropriate measures. That cicatrization may and does take place is shown in several specimens which I have removed, and in which scar tissue has been seen at either end of the split. In one, where a complete transverse tear had occurred, complete healing has actually taken place. This last specimen I can show you, and a curious feature about it is that in its posterior part a second tear has taken place, the detached portion being rounded and somewhat discoid in shape (see Fig. 8). Complete healing, of course, can only take place in a recent case if the edges of the tear are kept in accurate apposition over a long period; and, inasmuch as it is impossible to be certain that apposition in a given patient has been secured, a good result will be problematical and impossible to foretell. However, if your patient be in easy circumstances it is certainly worth while, after getting rid of the effusion, to thoroughly immobilize the articulation in a plaster-of-Paris splint, extending from the toes to the upper part of the thigh. After this has been in position for two months it may be removed and cautious movements commenced.

In the case of patients who do not need to earn their living by hard manual work, and who are content to give up such strenuous games as football, hockey and cricket, or who are unwilling to undergo operative measures, treatment such as I have just recommended is also indicated.

Where a tear has resulted sometime previously there will probably have been more or less numerous attacks of joint pain, and we may safely assume that in each attack the damage to the torn cartilage has increased. Under these circumstances I am sure no good purpose is secured by prolonged rest, and the best treatment then in patients who refuse operation is, after getting rid of all swelling and pain, to prevent rotatory movements by wearing a well-fitting knee brace. Such a brace, to be effective, is necessarily somewhat cumbersome and clumsy, but with it, providing he is content to give up violent forms of exercise, subsequent attacks may be completely prevented.

Where the patient is engaged in manual labour, and a perfectly sound joint is consequently necessary, operative treatment must be recommended—of course, in the absence of intercurrent disease. This treatment ought also to be recommended in the case of a man or woman who is desirous of still taking part in open-air sports, such as football, cricket, hockey, riding, etc. Again, where inability to fully extend the knee persists, the same treatment must be carried out.

The question now arises as to the time when one should operate. Personally, I always wait a week or ten days after an attack. I do this because by that time the devitalizing effect of the injury shall have passed off. Previous to and during operation, the most rigid antiseptic precautions are necessary, and, for my own part, I do not use dry sterilization, but rely mostly on chemical methods. If possible, I keep the patient in bed for thirty-six hours previously, and at the beginning of this period commence preparations. The whole of the skin of the leg and thigh is shaved, thoroughly washed with spirit-soap and hot water, then with turpentine, and finally with methylated spirit. It is then thoroughly rubbed over with swabs of cotton-wool wrung out of 1 in 1,000 corrosive sublimate solution, and finally is covered with a compress wrung out in the same solution, extending from the middle of the thigh to the middle of the leg; this compress is covered by mackintosh and secured by a bandage. Twenty-four hours later the thigh and leg are again washed with the 1 in 1,000 corrosive solution and a compress wrung out in the same solution reapplied. When the patient is anaesthetized a tourniquet is applied round the thigh, and, after the compress is removed, the operation area is thoroughly washed with a solution of 1 in 20 carbolic acid; the knee is then thoroughly flexed and kept in this position by my assistant, who stands opposite to me.

I use a transverse incision, commencing, in the case of the internal cartilage, at the inner border of the patella tendon and extending backwards for a distance of about 2 in. in the line of the articulation. I am firmly convinced that this incision gives the best exposure, and, if the internal lateral ligament be not cut across, the after-stability of the joint is not interfered with. Some years ago, in the practice of another surgeon where this precaution was not observed, a somewhat unstable joint resulted, in which there was a certain amount of abnormal lateral mobility.

On dividing the skin and subcutaneous tissue a strong aponeurosis is exposed, which is also divided in the length of the incision; then the capsule and subjacent synovial membrane is opened and the interior of the joint exposed.

If the split or tear be situate in the anterior part of the semilunar cartilage it will be quickly recognized, particularly if the torn portion be displaced towards the centre of the joint. In a few cases, and even where the tear has been fairly extensive at the time, on the joint being opened the parts seem in their normal condition, and it is only on careful scrutiny that the line of tear is discovered.

Where the damage is in the posterior part of the cartilage, in a large number of cases it will be impossible to demonstrate it until the anterior extremity of the cartilage is divided and strongly pulled upon, when the torn portion will suddenly snap forwards from behind the condyle, and it will then be found that, until this has again been reduced into its normal position or has been removed, the joint is incapable of being fully extended. If this snapping forwards be once witnessed, it will readily be appreciated that at the time of the accident an audible snap or click will occur, and it will also explain the subsequent signs and symptoms. On three occasions at least I have had to open the joint a second time, where a posterior split existed and had been overlooked at the previous operation. If the anterior extremity of the cartilage had been divided and strongly pulled upon, this mishap would not have occurred. Personally I aim at removing the entire cartilage, and in the large majority of cases this is quite an easy procedure. After the cartilage is removed the capsule and synovial membrane are sutured in one layer with thin catgut; the incision in the aponeurosis is similarly dealt with, and the edges of the skin are brought together with a subcuticular suture. An antiseptic dressing, consisting of gauze wrung out of a solution of corrosive sublimate in methylated spirit (1 in 1,000) is then applied, and over this a thick layer of wood-wool wadding, both being kept in place by a domette bandage. I use no splint in the after-treatment, and encourage the patient to move his knee, as far as the dressing will allow him, as soon and as freely as he can. During the operation neither my assistant's nor my own fingers come in contact with the wound, all manipulations being carried out with instruments, and, needless to say, india-rubber gloves are worn by operator, assistant, and nurse.

After the operation, for the first two nights, a rise in temperature, to the extent of 1° or even 2°, need cause no alarm, and during the same period severe pain may be experienced, sufficiently bad to necessitate one or two hypodermic injections of morphine. Beyond this the convalescence of the patient is quite straightforward, and at the end of a week the dressing is taken down, and the subcuticular suture is removed. There is no difficulty with after-stiffness, and even at the end of ten days the majority of the patients are able to fully flex the knee and to commence to walk about without any support.

The operation is a very successful one, and it is

extremely rare for patients to be otherwise than completely relieved by it.

In several cases I have removed both internal semilunar cartilages with an interval varying from six weeks to five and a half years between the two operations. In one case both internal cartilages were removed at the same operation; in a further case both cartilages, in the same knee, were removed at the same operation, and in three cases both cartilages in one knee were removed in two operations with an interval varying from eight months to three years between the two operations. All these patients did well.

In conclusion, I would state that for a long time the question of injuries to the semilunar cartilages has not received the recognition it deserved, and it is only in the past few years that these injuries have commenced to be really understood. This injury, which is so common in such an important industry as coal-mining, which undoubtedly causes a large amount of unemployment, and, therefore, results in the loss of a great amount of money, surely should have commanded more attention.

II.—ALBERT J. WALTON, B.Sc., M.S., F.R.C.S.,
Assistant Surgeon, Dreadnought Hospital, Greenwich.

IN a previous communication[1] I attempted to show that injuries of the semilunar cartilages were brought about by a condition of hyperextension of the knee, and not, as is usually taught, by a rotatory movement while the knee is in a position of semiflexion. The proof of this argument was based upon the study of the anatomy and the movements of the joint.

Time will not permit me to-day to enter as fully into this aspect as I should have desired, and therefore I must refer to this previous paper for a full account of these points. I shall, however, again consider the condition from two aspects. First, the anatomical; and, secondly, the clinical.

Anatomy.

Examination of the dissected knee-joint shows that during extension both lateral ligaments, the posterior ligament, and the two crucial ligaments are tightened. Of these latter it is usually taught that the posterior is loose during extension; this is, however, not the case. Its upper extremity is attached behind the mean centre of rotation of the articular surface of the femur, as is well shown in the diagram (Fig. 1), and must, therefore, be tightened during extension. In other words, during extension the tibia will approximate to the femur

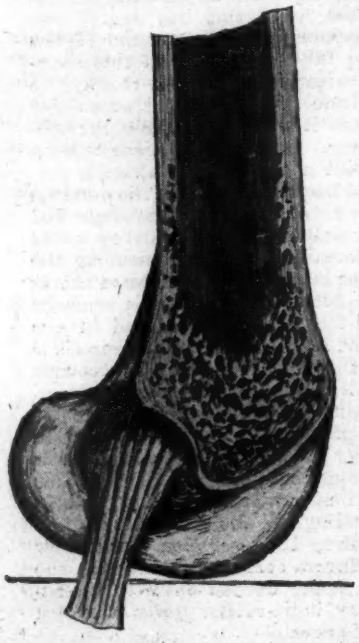

Fig. 1.—Attachment of posterior crucial ligament to outer surface of internal condyle.

At the termination of the movement of extension, the tibia will rotate outwardly on the femur. This is due to the pull of the two crucial ligaments, which, being attached to the internal and external condyles of the femur respectively, will act as a "couple" as represented in the figure (Fig. 2). That this is so is well shown by the dissected joint which I present. It is in no way dependent upon the shape of the articular surface.

This screw action is simply a continuation of and part of the movement of extension.

The internal semilunar cartilage is loosely attached anteriorly. Laterally it is firmly attached to the internal lateral ligament, and behind this it is protected by the semimembranosus muscle.

On section it is "wedge"-shaped, the wedge fitting between the articular surface of the two bones. It is a very elastic substance, its two ends tending to approximate; this being well shown in a freshly removed cartilage.

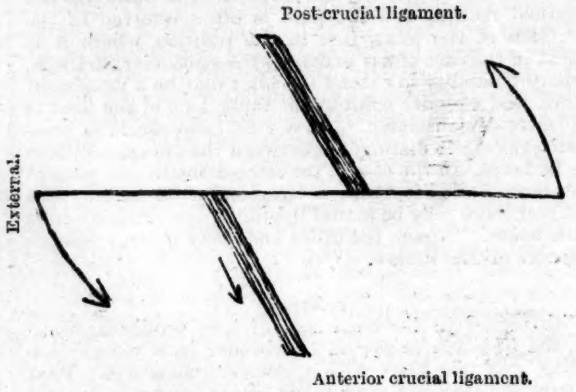

Fig. 2.—Action of the crucial ligaments in causing internal rotation of the femur at the end of extension.

There is therefore always a tendency for the ends to pass into the interior of the joint, and since the anterior end is markedly the thinner of the two, this tendency is also more definite anteriorly. On extension of the joint, therefore, the tibia and the femur will be forcibly pulled together. This force, owing to the screw action, will be almost wholly exerted on the inner side and anteriorly. The following conditions may then take place:

1. The anterior end of the cartilage, having passed somewhat into the interior of the joint by its own elasticity, may be caught during a sudden movement of extension between the approximating bones and forcibly crushed, fracture of the cartilage thus taking place (Fig. 3).

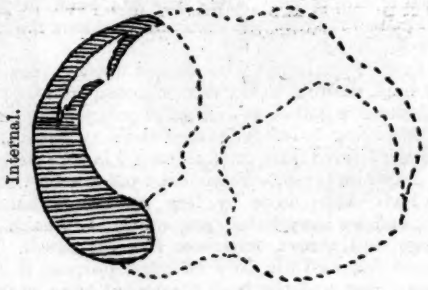

Fig. 3.—Cartilage crushed by pressure between femur and tibia.

2. The wedge-shaped cartilage may be forcibly squeezed out from between the bones and torn from its attachments. This will either take place anteriorly or at the junction of the fixed and movable parts—that is, just in front of the internal lateral ligament (Fig. 4).

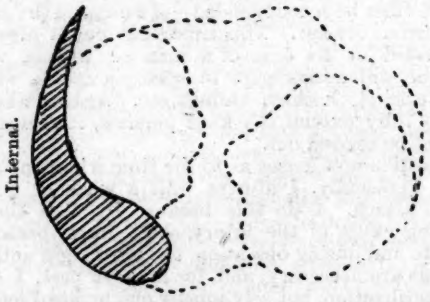

Fig. 4.—Separation of anterior attachments of cartilage by forcible extension.

3. It may have passed sufficiently far into the joint to be caught on the outer side of the internal condyle of the femur. On extension it will then be pushed into the intercondylar space (see Fig. 5).

4. After its attachment has been torn by the first movement of extension of the knee, it may, on flexion of the

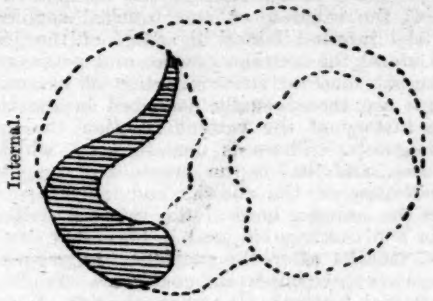

Fig. 5.—Position of separated cartilage on full extension. Second step.

joint, pass between the two bones and be crushed on the second movement of extension, a secondary fracture of the cartilage thereby arising (Fig. 6).

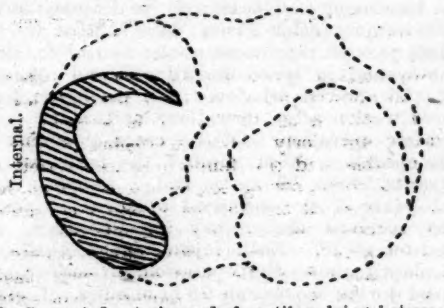

Fig. 6.—Separated anterior end of cartilage lying between femur and tibia on full flexion.

It will be readily noted that when the cartilage is thus crushed it prevents approximation of the two bones, giving rise to what is clinically recognized as locking of the joint.

All these conditions, which are identical with those found clinically, can be easily reproduced in anatomical specimens, but there is no evidence from such anatomical specimens that any lesion of the cartilage can occur while the joint is in a position of flexion or semiflexion.

As has already been shown, the pressure between the two bones is, owing to the screw action, most marked on the inner side. In fact, lesions of the external cartilage cannot readily be caused.

Clinical Aspects.

It has been shown beyond question that lesions of the internal cartilage are much more common than those of the external.

In the series of cases I have already reported from the London Hospital, 73 out of 77 were internal. Since then I have operated on a further 8 cases, in all of which the internal cartilage was alone affected.

It is also equally agreed that the anterior part of the cartilage is much more commonly affected than the posterior part. In the above series of cases the site was noted in 76. The anterior end of the cartilage was alone affected in 70 cases.

It was previously thought that either separation or transverse fracture was the common lesion. Rutherford Morison showed, however, that a longitudinal fracture was much more frequent as a primary lesion, although such a condition is liable to be overlooked, unless carefully looked for.

The more recent cases of this series have fully borne out this contention—7 of the 8 recent cases mentioned above showing this change.

More rarely transverse fracture or separation of the anterior extremity takes place. In 5 cases the cartilage remained attached at its extremities, but was separated at its circumference.

The nature of this lesion is readily accounted for if one believes that the cartilage passes sufficiently far into the interior of the joint to be caught by the apex of the wedge of the internal condyle of the femur during extension.

The clinical condition therefore agrees absolutely with that which can be artificially produced.

All investigators, however, are agreed as to the lesion being caused with the knee in a position of semiflexion. I have shown that in cases met with in a general surgical practice the history, if carefully inquired into, will show that the knee was really hyperextended at the time of the accident, but owing to the sudden pain the joint is immediately flexed, the patient falls, the cartilage passes into the joint, the knee is locked, and the patient on attempting to rise finds that the knee is fixed in the flexed or semiflexed position, hence giving rise to the belief that the accident took place when the joint was so flexed.

In the majority of the cases I have previously reported such a history of extension was clear, and in the further 8 cases it was also beyond question.

At the time of my last report my views were severely criticized in as far as they applied to miners. I have no experience with this class of patient, but Mr. Finch has since shown very clearly that the same factor of hyperextension is true for them also. I shall therefore leave him to deal with this aspect of the question and to overcome the only definite objection to my views.

As regards the other types of cases, 30 were caused at football. Of these, 3 kicked at the ball and missed it; 4 were passing the ball from the wing to the centre, or vice versa, the ball being hit by the inner side of the foot whilst the leg was extended.

In 21 the foot was everted during running, the front part of the foot of necessity coming into contact with the ground whilst the leg was extended. In the remaining 2 a second player fell across the patient's outstretched leg.

In a further 22 cases the patient was walking or running over rough ground. Here, as in the larger group of footballers, careful questioning elicited the fact that the foot was everted as it first came on to the ground, and that at this stage the knee was completely extended.

A careful consideration of the mechanism of these movements will show that this must indeed be the case.

In 11 the patient fell from a height; in 3 he was stepping from the train to the platform, the position of extension being again clear.

The lesion is not uncommon among boxers and wrestlers, but in this series there were only 3 such cases; 2 were boxers, and both gave a clear history of rotating to the right and drawing the body backwards to avoid a blow, whilst the left leg was extended and in advance, the screw action of hyperextension on the left leg, which was the one affected, being self-evident.

In 4 cases the condition arose whilst jumping; here the forcible extension at the moment of the take-off is evident.

Of the 3 further cases, 1 occurred while throwing a ball; one while the patient was rising from the stooping position; and the third from being thrown out of a bunk whilst the foot was caught, the leg being hyperextended, and the femur rotated inwardly on the tibia. In the remaining 8 cases no history of the accident was given in the notes.

It is important to note that nearly every case that I have examined myself gave at first a history of having twisted the knee while it was semiflexed, but when an exact description of the accident was asked for, not only was hyperextension at the moment of the injury made clear, but the patient corrected himself and stated that the leg was either straight or being forcibly straightened when the accident occurred.

Such a history is in my experience constant and definite, although every care is taken not to put leading questions, and as far as possible not to suggest to the patient what answer is required.

I venture to think, therefore, that our views as to the causation of this lesion must undergo revision, and all the evidence at our command, both anatomical and surgical, is in favour of it being caused by hyperextension with its terminal movement of external rotation of the tibia.

REFERENCE.
[1] *Proc. Roy. Soc. Med.*, November, 1912.

DISCUSSION.

Mr. R. H. Anglin Whitelocke (Oxford) thanked Mr. Martin for his thorough and complete survey of the subject. He was in so much agreement with him as to the etiology

and in a measure with his treatment, that he would but refer to a few of the points to which Mr. Martin had not referred specially. As regards anatomy, he believed that the integrity or otherwise of the internal lateral and crucial ligaments was the important one in the etiology of most of these ailments. When either or all of these ligaments were torn, the joint became weakened and liable to injury as increased external rotation was permitted. Sprains should never be regarded as simple where there was much effusion, especially if this followed immediately, the effusion in these cases being of blood and indicative of considerable amount of tearing of ligaments or periosteum, or even detachment of bone. One should never be satisfied in such a condition until fracture had been excluded by a radiograph. Simple sprain was treated by elastic pressure, and rupture of ligaments by open operation and suture. As regards haemophilia, he mentioned a case where, in mistake, he opened a knee to remove a torn cartilage, and found the patient a haemophilic. For days he bled, and the only means which succeeded eventually in stopping the bleeding was by using horse serum by injection; two injections were enough. One form of loose body that he would specially like to call attention to was the variety which was usually single, and often described in textbooks as concavo-convex in shape. These were the result of separation of a portion of an articular cartilage, sometimes the result of strain, at others from a direct blow. These loose bodies continued to grow for years, although completely detached and floating in the cavity, and should be always removed. He possessed a specimen of which he had a history of increase in size for over twenty years. He believed in the case of damage to semilunar cartilages that the injury occurred when the joint was in slight flexion with outward rotation, and not in extension, as exemplified by its frequent occurrence in football players and miners. His experience was with athletes mainly, and he believed that in them the injury was mainly and primarily a transverse fracture, becoming later a longitudinal one, and not longitudinal splitting, as is mainly found in quarrymen and miners. Partial avulsion of the tubercle of the tibia was common in athletic boys from 14 to 16. The pathology was, in addition to the bony separation, a tearing of the periosteum in the neighbourhood, and a haemorrhage into the infrapatellar bursa. The injury resulted always in cure in from two to three years, though with permanent thickening of the tubercle, but complete restoration of function. An operation might be performed to deal with the condition if the friends should so desire, but it was, however, never necessary.

Mr. E. W. HEY GROVES (Bristol) expressed the opinion that neither flexion nor extension was the real anatomical position, but that it was violent rotation which tore the cartilage. It was as difficult to make an accurate diagnosis of internal derangement of the knee-joint as of internal derangement of the abdomen. They settled the difficulty by opening the abdomen, and in the same way they must decide that the best way to settle their difficulties of the knee-joint was to open the joint. Better results would be obtained by free radical exposure of the joint by a transverse incision carried through the patella.

Dr. T. KENNEDY DALZIEL (Glasgow) pointed out that in addition to the injuries described by Mr. Martin they occasionally found a condition which might be described as pulverization of cartilage. Direct violence through the one bone acting on the other forced the cartilage from the bone. Such fragments probably accounted for some of the fine foreign bodies which might be found in the joint. These denuded areas of bone healed, and an irregular scar would mark the site.

Mr. ERNEST FINCH (Sheffield) said: Early this year I investigated 102 cases of internal derangement of the knee-joint treated at the Royal Infirmary, Sheffield, in the five years 1907-11. I was only able to examine 60 of these cases, so any figures I may quote will be confined to these, which I have personally examined. The investigation was undertaken in order to ascertain (1) the wage-earning capacity after operation, (2) the length of time off work before and after operation, and (3) the type of accident which caused the injury complained of. A clear conception of the anatomy of the knee-joint is essential for diagnosis and treatment. Especially would I lay stress on the external rotation of the tibia at the completion of extension, also the relation of the internal semilunar cartilage to the internal lateral ligament of the joint. The internal lateral, the anterior crucial, and post-crucial ligaments are all tense at the completion of extension. The symptoms are those usually described in the textbooks. The history of the patient is often the main means of diagnosis. There is one sign on which I would lay stress, and that is the presence of a spot of exquisite tenderness, on the anterior and inner aspect of the joint over the anterior horn of the internal cartilage, when this is the cartilage injured. This sign can be elicited often months after the accident. In regard to diagnosis there are three important conditions to differentiate; (1) Synovial fringes; (2) osteo-arthritis; (3) early chronic infective arthritis. In regard to treatment, if seen immediately, reduce, cold application, rest, and retentive apparatus; if seen after the patient has had the further trouble of recurrence, then operate. The two points of importance are: (1) Asepsis; (2) remove the whole cartilage; no resection, no stitching in position should be done. After treatment I advocate: (1) No drainage to the joint; (2) movement after seven days, active by the patient at first, passive movement at the end of fourteen days if the wound is quite healed; (3) no retentive apparatus to be allowed whatever; (4) discharge from hospital three weeks after operation, and start work six weeks after operation. Of the cases examined by myself after operation, 60 in number, the following are the chief points. Sex: 59 males and 1 female. Age: youngest 11 years of age, operated upon at 24 years; 1 case also received the injury at 12 years, and was operated on at 29. Both injured at football, and both have played since the operation. *Occupation.*—Miners injured during occupation 25 in number. *History.*—Position of the joint: Sudden extension from a position of partial flexion in 34 cases, flexion in 11 cases, uncertain in 14 cases. I asked every patient to get into the position he occupied at the time of the accident, and I satisfied myself that sudden extension from a position of partial flexion accounted for the majority of the "uncertain" cases. The football injuries were definite and were 5 in number. Four were in the act of kicking when knocked over, and on reaching the ground the joint was fixed. The other patient was running when he was tripped, and the joint was fixed almost immediately. That the suddenly extended position causes accident has recently been borne out by a medical colleague while keeping goal at football. *Time in Hospital.*—Average of 60 cases is 22 days, shortest time 12 days, longest time 37 days. *Back to Work.*—The average of 60 cases is 7 weeks after operation, the shortest time was 16 days. Five cases have not returned to work. Since these cases were seen one of them who had not worked for six years, having injured himself in 1907, when the cartilage was stitched, has now gone back to work, the cartilage having been removed in April of this year. The reason he gave for inability to work during the past six years was that the joint was often locked. In one other case there was marked ankylosis. In the other three cases I could find no cause for non-return to work. A few of the other noteworthy cases are:

J. B.—Left internal cartilage removed 1906; right internal cartilage removed 1909. Both injured at football. He still plays football.

W. P.—Both internal and external cartilage removed. He is now working.

B. C.—Injured twenty-five years ago; then operated upon with bad result. Re-operated, 1909. Wage-earning capacity now the same.

The cartilage was stitched in three cases, one with good result. Two still have locking. One of these since operated on, and now has a perfect result. *Patients' Opinions:* Forty cases were pleased with the result; nine cases fairly successful; eleven cases not satisfied at all. Creaking in the joint I do not think of importance; many of the cases who were back at their own work had it well marked. Only those cases who had not worked had wasting.

Mr. COTTERILL (Edinburgh) remarked that he took a special interest in the subject of derangement of the knee-joint, as it was just forty years since he assisted the

late Professor Annandale in all his pioneer operations in this department of surgery. He disputed several points brought forward by previous speakers. (1) It had been said that the whole thickness of the cartilage was never turned in. That had not been Mr. Cotterill's experience, and he had operated on many cases where the whole thickuess of the anterior end of this cartilage had been separated from its attachment and turned in. (2) He was strongly of opinion that the best incision was a longitudinal one, and when it was necessary to examine the whole joint this vertical incision could be produced, the tubercle of the tibia chipped off, the patella externally dislocated, and the joint widely exposed. The tubercle was replaced and fixed in its old position by a nail. (3) It was very rarely necessary to excise the whole cartilage. It was sufficient to remove the part projecting into the joint. (4) The lesion *never* took place in full extension (as stated by Mr. Walton), as then the cartilage was tightly "splinted" between the bones. It occurred *in process of extension* from the flexed position, when the tibia was externally rotated on the femur, a grinding action being thus brought about. (5) It was advisable to operate in certain cases, as there was a tendency to osteo-arthritis, etc., being caused in chronic cases. Forcible hyperextension was of value as a means of certain identification of any substance, displaced cartilage, loose body, etc., lying in an abnormal position between the joint surfaces.

Mr. McAdam Eccles (London) said: The partial separation of the tubercle of the tibia in an adolescent is by no means uncommon, and, as Mr. Whitelocke has said, may lead to prolonged convalescence. In some cases this continuance of discomfort and inability to carry out athletics is due not so much to the tubercle but to an ossification in the patella tendon, easily shown by a skiagram. This formation of bone is in its nature similar to traumatic myositis ossificans. The small mass of bone may be quite separate from the tubercle, but its presence appears to cause the persistence of the bursitis. I have operated upon several of these cases by longitudinally splitting the patella ligament fibres, removing the mass of bone and the inflamed post-ligamental bursa.

Mr. Chad Woodward (London) said: I entirely agree with Mr. Martin's remarks about the undesirability of using a general anaesthetic in the ordinary cases of solitary loose body in the knee-joint. With the aid of a few cubic centigrams of a 1 per cent. solution of novocain the body can be harpooned and then removed through a tiny incision. Patients after this little operation walk about in eight or ten days. The term "Schlatter's disease" includes, in my opinion, several distinct pathological entities. There is one variety which was well described years ago by Sir James Paget. It is of the nature of a chronic traumatic periostitis and osteitis around the tubercle of the tibia and anterior aspect of inner tuberosity. In several such cases under my observation the patients were of what one can only describe as the loose-jointed type of person, and the ligamentum patellae was unusually long. The disability may persist for years, but they all recover when complete ossification takes place and the tubercle becomes joined up to the tibia. But many prefer a more speedy cure. They do well after operation. Most previous speakers have largely confined themselves to discussing the cases requiring operative interference. I should like to draw attention to some points in the treatment of those cases of sprain which form the vast bulk of all knee-joint cases and which, if properly dealt with, seldom need operation. The first indication is to empty the joint of fluid. In slight cases this is readily accomplished in a few days by daily rubbing and the application of firm elastic pressure. In severe cases the joint should most certainly in the first place be emptied by aspiration. The most striking feature in these cases, when seen some weeks after the injury, is the extreme degree of muscular wasting, frequently amounting to as much as an inch and a half of difference in the measurements of the two thighs. This is chiefly due to the antiquated notion of the necessity for rest in these cases. As soon as the fluid has been removed exercises should be systematically undertaken together with massage. In a week or two the knee is firmly strapped and the patient allowed to go about as usual.

The President, Mr. Thelwall Thomas, preferred an oblique incision, and did not think it necessary to remove the whole of the semilunar cartilage, and thought from his experience that the injury was caused during flexion.

Mr. A. M. Martin, in reply, regretted that he had not dealt with fracture of the tibial spine, as he had thought that injury outside the scope of the discussion. He agreed as to the necessity for an *x*-ray photograph in injuries of the knee-joint. On the anatomical point raised by Mr. Walton, he was perfectly convinced that it was absolutely impossible for such an injury to take place in the extended position. Miners worked entirely in such a posture that the knees must be flexed, and it was while in this position that the injury occurred. In foot-ball players the non-kicking leg was the one affected. He thought that the presence of a point of tenderness insisted upon by some speakers was of no great moment; the same sign was present in osteo-arthritis. After operation for torn semilunar cartilage the time spent in hospital was no more than eight to ten days. No splint was employed. Active movement was permitted as soon as the patient felt inclined. Active movement was more reliable than passive movement. He most cordially thanked the members of the Section for their kind attention.

ON THE TREATMENT OF COMPOUND AND COMMINUTED FRACTURES.*

By Ernest W. Hey Groves, F.R.C.S.,
Bristol.

It is rather remarkable that in the enthusiasm which has been displayed during late years concerning the operative treatment of fractures there has been so little said or done on the subject of compound or severely comminuted cases.

The two chief protagonists of the operative treatment of fractures—namely, Lane and Lambotte—lay great stress on the inadvisability of applying their methods to any case that is complicated by an open wound. And these methods are so difficult of execution even in simple cases that they become for the average surgeon quite impossible if they have to be applied to the union of many small fragments. Now, it is a matter on which great difference of opinion still exists as to the advisability of operation upon cases of simple fracture. Great authorities, such as Bardenheuer and Lucas-Championnière, consider that as good or better results can be obtained by simple extension with massage and early movements, but all are agreed that the compound fracture with much displacement and the severely comminuted fracture gave bad results by all methods of treatment; and yet these very classes of case have been withheld from the scope of the usually described operative methods. For the last three years I have been trying to solve this problem, working on experimental lines first, and then adapting my conclusions to clinical work. First let me summarize the difficulties that have to be overcome:

1. *Mechanical Difficulty of Fixing Small Fragments.*—Supposing the shaft of the bone to be broken into a number of small fragments, it is very difficult by any system of plates and screws to restore a firm continuity to the shaft of the bone. This is a difficulty when experimenting with a dry bone outside the soft parts, but the difficulty is greatly increased when the bone has to be attacked *in situ*. The plates can only be applied to a little more than one half of the circumference and fragments furthest removed from the surface cannot be fixed. Then the number of plates and screws necessary is so great that there is much danger of shutting out the bone from its chief blood supply from the periosteum.

2. *The Difficulty of Operating upon a Septic Bone Area.*—Every one who has operated upon fractures insists on the overwhelming importance of asepsis. It is only courting disaster to operate upon a case in which the skin is so abraded that it cannot be sterilized. And a bad

* The expenses of this research were defrayed by a grant from the British Medical Association; see Supplement, p. 344.

compound fracture in which dirt is ground into the bone is impossible for direct attack. I am not speaking of trivial wounds which heal cleanly within a few days, but of dirty lacerated wounds which lay open the fractured area.

3. *The Difficulty of Applying Non-operative Methods to the Cases under Consideration.*—It is a matter of common experience that a bad compound fracture is one which is most difficult to treat with due regard to the functional usefulness of the limb. I give one example which illustrates the usual results, even when one is keenly alert and applying all possible methods to obtain a good result. A woman was run over and sustained a compound and comminuted fracture of the lower end of the tibia and fibula. Several large fragments of the tibia had to be removed, as they were necrosed and septic, then parts of the overlapping fibula were resected in order to make the two bones of the same length. Next a sliding splint was devised by which an extension of ten pounds was maintained on the foot whilst the wound healed and the fracture united, and yet in spite of this the excessive reaction which always takes place in this type of fracture resulted in such contraction of the parts that the bone ends were firmly joined in a vicious manner with much overlapping. The patient, seen a year after the accident, could walk with a stiff ankle, and she was grateful that her foot had been saved, but she is crippled for life. The main problem to be solved is how to keep up such powerful extension that overlapping of fragments will be prevented, and how to do this in such a way that during the prolonged period of bone healing the joints and muscles may be exercised and the wound dressed without disturbing the fixation of the bone. The nail extension method is undoubtedly the most powerful means at our disposal for applying extension to a fractured bone; I therefore sought to adapt this as a solution of the problem.

Experimental Results.—I made an apparatus consisting of two bars which transfixed the bone transversely, and which were held in place by longitudinal bars at the sides of the limb.

In these cases the bone had been divided by a simple saw cut. The animals could run about within a few days of the operation, and at the end of a week or a fortnight they could do so with little or no limp. The union of the bone was rapid, firm, and accompanied by the minimum of callus formation. Not only do these specimens exhibit the most ideal method of healing, but they show how this transfixion apparatus may be left in place as long as ten weeks without causing any irritation either of the bones or of the soft parts.

Experiments on Severely Comminuted Fractures.—Having obtained a series of successful results with this apparatus in simple fractures, I next applied it to the severely comminuted cases. The skiagrams handed round show the degree of comminution produced (one after twenty-eight days with the fragments and periosteum in place, one after forty-two days with the fragments removed, and one after thirty-five days with the periosteum excluded). If all the fragments and periosteum be left *in situ* a rapid firm union occurs, with some callus excess. If the fragments be removed the union is very slow, as it only takes place by bone proliferation from the ends of the main fragments. Now if the periosteum be excluded, union takes place, but rather slowly, by reason of the bad vascular supply of the fragments.

Clinical Application.—I will only give two examples of the application of this method in human surgery. One is from the leg of a man with comminuted fracture of tibia and fibula. The skin was so contused over the seat of fracture that direct operative exposure was inadvisable. He wore the apparatus for four weeks; he had good functional result at the end of three months, and there was good union of the bone with no shortening.

The other example is from a similar case, and the apparatus had the effect of replacing the comminuted fragments in almost perfect anatomical position.

The method is not so readily adapted for the femur and humerus, because of the impossibility of transfixing the proximal portion of these bones. I attempted at first to overcome this difficulty by using an apparatus which transfixed the lower end of the femur and took a bearing above from a ring like that of a Thomas's knee splint. This, however, does not come up to my ideal of mechanical efficiency, and I feel sure that a better apparatus is one like Lambotte's "fixateur," which transfixes the bones from one side only. (The author then showed some cats which had been the subject of comminuted fractures involving about a third of the shaft of the tibia. They retained both the shape and function of the leg at periods varying from ten days to four weeks after the operation.)

PROSTATISM—THE PATHOLOGICAL BASIS OF THE OPERATIVE TREATMENT.

By HENRY WADE, M.D., F.R.C.S.Edin.,
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THE favourite method of operative treatment of prostatic dysuria, as practised in this country and throughout a large part of the surgical world, is suprapubic prostatectomy according to Freyer's method. This operation has won for itself a pre-eminent position in the domain of surgical practice, and by means of it prompt and complete relief have been frequently afforded for a most distressing ailment that rapidly undermines the patient's health. The great advance that has taken place in the treatment of certain varieties of prostatic disease by Freyer's operation can be gainsaid by no one, and in this paper I shall have occasion to show how suitable it is for a certain type of case. At the same time, it will be shown that there are cases of prostatism for which it is unsuitable, and I shall particularly refer to its utility for the earlier manifestations of the disease for which it is executed, and consider the best means of treating such cases.

Although it is the rule for a speedy and complete recovery to take place after suprapubic prostatectomy, the operation is undoubtedly associated with a high mortality, and sometimes is followed by disagreeable complications, despite the brilliant results of a limited number of surgeons. Reasons may be advanced to account for this state of affairs on clinical grounds, but an accurate conception of them can only be obtained after the surgical pathology of the disease is studied in the light of the operative treatment. It is the object, therefore, of this paper to consider the question of the treatment of prostatic dysuria from the standpoint of its pathology and the pathological findings observed in the parts removed by operation, in cases terminating fatally and in cases dying naturally of the disease. Material of this nature has been examined from 134 cases.

Definition of Prostatism.

The prostate gland is frequently the site of disease which produces local deformity of the organ, interference with the complete emptying of the bladder, damage to the genito-urinary tract above, and serious ill health to the patient. The clinical indications of these are designated "prostatism."

Varieties of Disease Producing Prostatism.

It is recognized that prostatism may arise from a variety of pathological lesions. The majority produce hypertrophy of the gland; all are of the nature of chronic prostatic disease and at one period are amenable to direct operative treatment. In 134 cases examined three outstanding varieties of disease were present: (1) Prostatic hypertrophy or chronic lobular prostatitis, 110 cases. (2) Prostatic fibrosis or chronic interstitial prostatitis, 10 cases. (3) Prostatic carcinoma, 14 cases.

Prostatic Hypertrophy or Chronic Lobular Prostatitis.

The frequency of incidence of this variety of disease as the cause of prostatism is such as apparently to lead occasionally to the belief that it is the only cause. Its etiology has been the subject of much dispute. Thus, Wilson and McGrath, in their recent article, enumerate some thirteen different theories that have been advanced to explain its origin. I do not propose to enumerate these, but would suggest that the changes met with in this disease are in their essential nature so closely identical with those observed in another accessory sexual gland—the female breast, when the site of multiple cystic disease

or chronic lobular mastitis—that their origin probably resides in factors that are essentially identical. It appears to me likely that prostatic hypertrophy will be found to owe its origin to some alteration in a normal internal secretion.

I do not consider the changes found in prostatic hypertrophy, or as I would prefer to call it chronic lobular prostatitis, to be indicative of a truly neoplastic process. In my opinion there occurs a senile hyperplasia, an aberrant overgrowth of tissue, not the result of the appearance of an independent new growth, but possessing a pronounced liability to develop into the same and become a carcinoma. The disease is virtually always associated with a great increase in the size of the gland, but it is occasionally met with in glands that are even smaller than normal, but clinically have produced pronounced indications of prostatic dysuria. Tandler and Zuckerkandl, as a result of their investigations made on subjects dying naturally with prostatic hypertrophy, have shown that prostatic hypertrophy is always found involving the middle lobe. In those cases that I have examined it is undoubtedly by far and away most commonly met with in that situation, but it is also clear that the lateral lobes are frequently also involved. In one specimen the disease was confined to the anterior lobe. This latter condition is, however, unique (Fig. 1).

Fig. 1.—Median sagittal section, prostate, showing chronic lobular prostatitis (prostatic hypertrophy) confined to anterior lobe.

When the prostate gland, the site of chronic lobular prostatitis, is sectioned and examined, it is usual to observe areas of glandular overgrowth scattered irregularly throughout its substance. These most usually form spheroids of varying size, and are surrounded by a ring of prostatic tissue that has been uninvolved in the disease, and become compressed to form a coarse trabecula throughout the gland. This displacement and condensation results in the formation around the periphery of the diseased organ of a thick layer of fibrous tissue, non-striped muscle, and compressed and degenerative glandular acini, which is known as the false capsule. It will be found that between the false capsule and the area of disease the flattened out glandular acini form a line of natural cleavage that permits of the easy separation of the diseased tissue beneath from the false capsule surrounding it. In a typical case these flattened acini form an arrangement somewhat like the perforation around a postage stamp, the perforation being, however, longer and the bridges much further apart. Very occasionally a spheroidal area of hypertrophy is seen where the stroma is increased very much in amount, and the gland tissue very much reduced in quantity, so that a fibromyomatous nodule is produced. These are, however, not true neoplasms, and of all the cases where I have observed it in only one did I fail to detect the presence of atrophied gland tissue amidst the fibrous and muscular tissue, and in this case circumstances did not permit of a complete section of the entire gland. These fibroid areas are probably the result of a former inflammatory process.

When the prostate gland enlarges in chronic lobular prostatitis, in addition to producing for itself a false capsule, it usually herniates itself through the internal vesical sphincter, and comes to lie directly beneath the thin mucous membrane of the bladder floor. The disease being confined to the middle and lateral lobes, the seminal vesicles and ejaculatory ducts are displaced into a region of safety.

The class of case above described, of advanced chronic lobular prostatitis, is the ideal one for suprapubic prostatectomy. Glandular hypertrophy has resulted in changes that render the operation possible and usually easy. It is important, however, to remember that cases of this disease are met with that are not ideal for this operation. These are: (1) Cases of chronic lobular prostatitis without hypertrophy; (2) cases of hypertrophy without intravesical herniation; and (3) cases of incomplete false capsule formation.

Prostatic Fibrosis or Chronic Interstitial Prostatitis.

Of the 134 cases I have examined, 10 suffered from prostatic fibrosis or chronic interstitial prostatitis. In this disease the prostate gland is smaller than normal, and is of a firm fibrous consistence. The intraglandular stroma is increased in amount, the whole organ being of a sclerotic nature. When the middle lobe of the prostate is especially involved a fibrous sclerotic bar is produced which mechanically leads to interference with the voiding of urine from the bladder, and a severe degree of retention may result (Fig. 2). When sections of the gland, the site

Fig. 2.—Median sagittal section, prostate; chronic interstitial prostatitis, to show median prostatic bar.

of chronic prostatitis, are examined, the appearance seen is very comparable to those observed in a cirrhotic kidney or liver. The glandular tissue is compressed and atrophied by strands of fibrous tissue amidst which portions of degenerated muscles are situated. Throughout the stroma areas are present where small cells, mainly of the lymphocyte type, are accumulated, such as are constantly observed in processes of a similar nature elsewhere. From the point of view of its morbid anatomy, therefore, the prostate gland in which chronic interstitial prostatitis is present differs in almost every respect from that in which chronic lobular prostatitis has occurred. It is perhaps its misfortune that the only features it shares in common are the clinical indications of prostatism that are so closely similar as to tempt certain surgeons to treat them by a similar operative technique, with occasionally disastrous consequences.

Carcinoma of the Prostate.

According to Young's most recent statistics completed from cases in his own clinic, 1 case in 5 of prostatic enlargement causing obstruction in old men is due to cancer. Out of the 134 cases investigated that form the basis of this communication, 14 showed carcinoma of the prostate to be present, or approximately 1 in 10. The clinical records of fully an equal number of cases of cancer treated by palliative measures, the prostate not being removed, exist, but as no material was available for investigating the morbid anatomy, they are, of course, not included; but they go to further confirm the accuracy of

Young's statement of the frequency of prostatic carcinoma. In 10 of the 14 cases prostatectomy was performed, and in 6 of them chronic lobular prostatitis was also present; and had obviously existed antecedent to the onset of cancer, and probably predisposed to its development (Fig. 3).

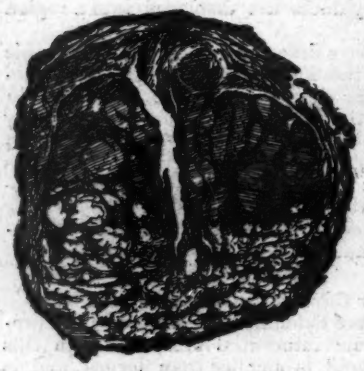

Fig. 3.—Horizontal section, prostate; medullary carcinoma.

Three types of carcinoma were found: (1) Scirrhous, (2) medullary, (3) adeno-carcinoma. They were very comparable to the types met with commonly in the female breast and showed a similar degree of malignancy, the last, like the adeno-carcinoma of Halsted, being the least malignant. Wilson and McGrath have noted how carcinoma of the prostate is frequently only revealed on careful examination of the specimen after its removal by prostatectomy. In the 10 specimens obtained by me from the operating theatre this proved to be the case. They showed how fortunately at first it is the rule for the malignant disease to commence in the centre of an area of chronic lobular prostatitis, so that at first enucleation is rendered even more easy. Complete celloidin sections being made, they also showed how necessary it is to obtain a complete section for examination before a certain opinion can be expressed on the presence or absence of carcinoma. In one case this was especially borne out. The patient underwent prostatectomy, a "lobar" removal being carried out. Clinically carcinoma was not suspected, and the ease with which prostatectomy was accomplished, combined with the speedy and uneventful recovery of the patient, did not arouse the suspicion that cancer was present. On examining the specimens, however, it was found that one "lobe" was the site of typical chronic lobular prostatitis, while the other showed the same change, but in addition there was present in the centre of it a mass of carcinomatous new growth. The presence of this was borne out clinically eight months later, when the disease recurred, and led to the death of the patient from cancer. When carcinoma of the prostate has progressed beyond this early stage of centrally situated disease one of three results may follow when the operation of suprapubic prostatectomy by blind dissection is attempted. Either the removal is accomplished with difficulty, a "total" prostatectomy being achieved, or, this being impossible, fragments of the diseased gland are extracted with difficulty, danger, and doubtful benefit to the patient, or the disease is found to be widespread, involving the adjacent blood sinuses and neighbouring glands, and consequently incapable of even partial removal.

Duration of Life and Cause of Death in Untreated Cases.

The frequency with which chronic prostatic disease producing prostatism occurs is difficult to estimate. Richardson states that chronic prostatic enlargement has been found in 34 per cent. of men over the age of 60, of which number 15 per cent. suffered from symptoms. Plondke has estimated that 33 per cent. of all men over 50 years of age suffered from enlarged prostate, and that 10 per cent. of these require treatment. He also says that catheter life results in a 100 per cent. mortality within an average period of four years. In cases dying naturally of prostatism, two forms of death are observed. In one a sudden renal infection brings the patient to a surgeon, under whose care he rapidly expires, with or without operative treatment, from acute consecutive suppurative nephritis. In these cases the organism has usually entered the blood stream from a focus of infection in the lower urinary tract and been determined to the kidney, whose power of resistance to infection has been weakened by prolonged backward pressure.

On the other hand, a slow renal destruction from persistent backward pressure may bring the patient within the care of the physician. The patient's loss of weight, persistent sickness, and failing heart naturally lead to attention being directed mainly to the state of his cardio-vascular system. The prostate is occasionally unsuspected by his medical attendant as the primary cause of his illness, and he dies, breaking up in a manner that is characteristic of so many medical ailments. Sometimes such a case comes under a surgeon's care at a stage just prior to the final breaking up. At this period the appearance of the patient is sometimes most deceptive. His general health is stated to be good. The amount of urea present in the urine is diminished but to no excessive degree. The ordinary tests of renal functional activity, when employed, indicate a certain degree of renal insufficiency. The surgeon may operate and the patient dies, slowly sinking from no obvious or apparent cause of complication, and at the *post-mortem* examination the ureters are frequently found to be dilated to an extreme degree, and the renal pelves dilated to such an extent that the parenchyma is reduced to a thin rim on the surface of two thin-walled multilocular sacs, which are all that represents the kidneys.

During the *post-mortem* examination of patients who have died of various diseases in the medical wards of the hospital, there can frequently be observed, in male subjects over the age of 50 years, indications of a mild degree of chronic prostatic disease with associated damage to the urinary tract above. It is virtually always found that no complaint has been made of this by the patient. It is usually unsuspected, and has virtually never received treatment. In these cases, however, the ureters and renal pelves are dilated to a moderate extent, and there is present a recent interstitial nephritis throughout both kidneys, and the renal parenchyma shows indications of pressure atrophy through its substance. When the pathology of these cases is viewed by one with a surgical mind, it is impossible to avoid the conclusion that the renal destruction as a result of the partial retention of urine from the prostatic disease has contributed to a certain extent to lowering the patient's power of resistance to a general infection, or has poisoned the heart muscle by the retained products of metabolism, which should be normally excreted by the healthy kidney. A most noteworthy feature of the *post-mortem* examination in all the cases of prostatism examined by me was the constant presence of chronic interstitial nephritis. The explanation of this, in my opinion, is that it is frequently due directly to the backward pressure present in these cases. The appearances seen suggested strongly that in those cases where the renal change was of long standing and had obviously existed before the onset of the prostatic disorder it had become aggravated further by it.

Operative Treatment.

The mortality associated with the operation of prostatectomy is high. The mortality of 1,000 cases operated on by Freyer is returned by him at 5.5 per cent. The operation of perineal prostatectomy has been especially practised in America by Young. He reports that out of 450 cases of benign disease 17 died, a mortality of 3.77 per cent. These results, from the point of view of successful operations, appear to be the best in existence. It must not, however, be assumed that these figures approximate even closely to those obtained in the wards of the general hospitals in this country and abroad.

Space will not permit of my quoting full statistics, but it can be confidently asserted that in these institutions the mortality from prostatectomy is approximately from 20 to 25 per cent. In this connexion Rovsing's remarks, when speaking of the results obtained by Freyer and Young, are of especial interest. He says:

> We must not let ourselves be led into believing that this is the real mortality of the operation as regards the great number of surgeons; you will find a far higher rate of mortality from this operation in the wards of the large hospitals all the world over. In my opinion, this is not due only to deficient technique as compared with that of the specialist. Perhaps, least of all so, but far more to the advanced stages of disease of the cases. The true mortality certainly cannot be estimated at less than 10 to 20 per cent.

We have observed, when considering the pathology of those cases that died from prostatic disease without

receiving treatment, how prostatism, if untreated, rapidly undermines the patient's health and power of resistance to infection, so that many patients are really in a dying condition when they come under the care of a surgeon. Page has compiled from the statistical returns of St. Thomas's Hospital returns that form a most interesting comparison in this connexion. He has collected the cases of prostatic disease that were admitted to hospital, and tabulated these according to the variety of treatment they received. The total number of cases treated was 132, and the mortality over all was 21.7 per cent. Those treated by catheterization had a mortality of 22.7 per cent., those treated by suprapubic drainage a mortality of 20 per cent., and those by suprapubic prostatectomy a mortality of 20.3 per cent. The value of these latter results is wherein they show the extent to which the patient's health was broken down prior to any surgical treatment, however simple, being adopted for the relief of the disease.

Cause of Death after Prostatectomy.

From the records of St. Thomas's Hospital, Page has constructed a statistical analysis of the cause of death after suprapubic prostatectomy. For our present purpose it is sufficient to mention that of the 15 fatal cases examined by him 10 died within a week of operation, and the majority of these from an acute local infection or from acute suppurative nephritis. An analysis of the 68 fatal cases that have occurred in the hospital to which I am attached has given a very similar result, and has gone to show that by far and away the commonest cause of death after suprapubic prostatectomy is septic absorption, arising out of the wound inflicted. And secondly, it has shown the fact that the majority of cases of prostatism operated on in the wards of a general hospital are extremely "bad lives" from the actuarial standpoint, on account of the pronounced degree of chronic renal disease from which they suffer.

Local Results of Prostatectomy.

A considerable amount of discussion has centred round the questions, What is removed when suprapubic prostatectomy is performed? and What remains of the gland after the operation is completed? When Freyer's operation is performed for hypertrophy or chronic lobular prostatitis, the tissue removed is found to come away in one of four different methods: (1) "Total" enucleation along with the prostatic urethra. (2) "Total" enucleation with conservation of the prostatic urethra. (3) Lobar enucleation. (4) Nodular enucleation. The main factor that determines the manner in which the diseased tissue is removed is neither the skill nor the dexterity of the surgeon, but the nature of the disease present in the gland.

1. *Total Enucleation with the Prostatic Urethra.*

Where a so-called "total" enucleation is performed and the prostatic urethra removed along with the mass of diseased tissue, it will be found that, although it conforms in the main to the size and structure of the enlarged prostate felt before operation, fortunately for the patient a true "total" extraction of the entire gland is never accomplished. In order to realize exactly what has been accomplished, the information gained in the operating theatre should be contrasted with the morbid anatomy commonly met with in cases of this disease that have died without operation and compared with the features seen in complete sections made of the tissue removed and of sections made of the prostatic bed and adjacent viscera in cases that have terminated fatally after the operation.

It is the experience of every surgeon who has performed the operation of suprapubic prostatectomy on several occasions to note the ease with which the large "adenomatous" hypertrophied prostate is frequently removed. The thin mucous membrane covering the mass projecting into the bladder is scratched through without difficulty. The line of cleavage is easily found. The finger sweeps readily round the mass of tissue, which is enucleated with celerity and in comfort, being held for an instant only, when the tough mucous membrane of the urethra is being torn through. The bleeding at the time is in no way alarming, and is soon naturally controlled. The cavity or prostatic bed out of which the tissue has been extracted contracts at once to a size approximately half of that of the structure it previously contained. The prostatic bed is felt to possess a smooth lining, and the inner vesical sphincter can be made out as a muscular ridge between the bed below and the vesical cavity above. When the morbid anatomy of such a case dying without operation is examined, it will be noticed how Nature would here appear to have designed the parts for the performance of suprapubic prostatectomy. The main bulk of the gland forms an intravesical projection covered by a thin and atrophied mucous membrane. The internal vesical sphincter is dilated and crushed into a region of safety, and surrounds the base of the intravesical mass. Damage to it is virtually impossible. The line of cleavage between the false capsule formed by the condensed, uninvolved prostatic tissue and the diseased lobes is distinctly defined by the flattened and atrophied gland acini, which form the ring of "postage stamp" perforations that have already been described in referring to the morbid anatomy of the disease. The process being confined to the middle and lateral lobes, the ejaculatory ducts and posterior lobe are displaced into a region of safety, and are separated from the area of hypertrophy by the thick-walled false capsule. This latter membrane also serves as a thick protecting coat to the large blood sinuses lying between the sheath and true capsule. The external vesical sphincter is also safe from any possible source of damage. When the tissue removed in such a case is examined, it will be noticed to possess the typical appearances of prostatic hypertrophy or chronic lobular prostatitis already described. Serial sections never reveal the presence of the ejaculatory ducts within it or of striped muscle fibres coating the specimen. A fatal issue may ensue even in such a case, however, and a further opportunity be afforded of observing what the operation accomplished locally. In order to investigate this latter question I have studied the pathology of eight fatal cases following prostatectomy. The pelvic viscera were hardened *in situ*, and thereafter complete celloidin sections of the prostatic bed and adjacent viscera were made and examined microscopically. For our present purpose one typical case will be referred to.

The case was that of a man who suffered from typical prostatic dysuria from prostatic hypertrophy. The gland was extracted without difficulty. He died, however, on the fifth day from pelvic cellulitis, owing to infection through the space of Retzius. Fig. 4 is a vertical median (sagittal) section traversing the prostate and prostatic urethra, which was removed.

Fig. 4.

Fig. 5.

Fig. 4.—Median sagittal section of prostate and prostatic urethra removed by the operation of suprapubic prostatectomy for chronic lobular prostatitis (prostatic hypertrophy.

Fig. 5.—Section of prostatic bed in fatal case after prostatectomy. Median sagittal section of prostatic bed after "total" prostatectomy, showing dilated internal vesical sphincter, false capsule, posterior lobe and external vesical sphincter. The seminal vesicles are seen on section between the bladder and rectum and the ejaculatory duct can be observed passing downwards and forwards and traversing the false capsule of the prostatic bed and opening into its lower limit. Between the ejaculatory duct and the rectum the compressed tissue of the posterior lobe is seen.

Fig. 5, a similar section of the prostate bed left after removal. Fig. 6 is a composite superimposed photograph with the gland replaced within the cavity from which it was extracted by operation. Owing to the contraction of the cavity of the prostatic bed, the photograph of the prostate had naturally to be reduced in size to permit of this. When Fig. 5, showing the prostatic bed, is examined, it will be noticed that the stretched internal vesical sphincter surrounds the upper vesical entrance to the cavity. The thick, smooth covering of the false capsule lining the space is visible. Microscopic examination shows this coat to consist of condensed prostatic tissue, consisting

mainly of muscle fibres and fibrous strands with compressed and atrophied gland acini amidst the fibres. The ejaculatory duct is clearly shown traversing the posterior wall of the space from the seminal vesicles above. Below and behind the ejaculatory ducts the compressed and atrophied posterior lobe is seen lying between the false capsule and space of Denonvillier. The undamaged external vesical sphincter and recto-urethralis muscles are seen beneath the prostatic bed. Fig. 6, where the

Fig. 6.—Drawing of photograph obtained by the superimposition of Figs. 4 and 5 to show the situation occupied by the enlarged prostate prior to its enucleation by operation.

tissue is superimposed within the cavity from which it was extracted, conveys in a manner more lucid than verbal description, the exact nature of the operation where a "total" enucleation of the prostate gland is accomplished by the operation of suprapubic prostatectomy.

Even in the case above described, serial sections showed that, at the margin of the lateral lobes, nodules of diseased prostatic tissue had remained behind within the false capsule.

2. *Total Enucleation with Conservation of the Prostatic Urethra by Suprapubic Prostatectomy.*

The determining factor in this operation is the consistence of the anterior commissure. Where there is situated in front of the urethra a mass of tissue tough in consistence and virtually devoid of disease, the finger is deflected naturally towards the urethra as it passes over the front of the gland and sweeps behind the urethra, conserving it wholly or in part in consequence. In such cases it will usually be found that the lateral lobes are not widely involved in the disease, which is mainly confined to the middle lobe. Horizontal sections of specimens from such cases show a typical horseshoe contour.

3. *Lobar Enucleation.*

The nature of the false capsule formed by the disease is the determining factor in such cases. In those cases where the morbid process is more lobar than lobular a

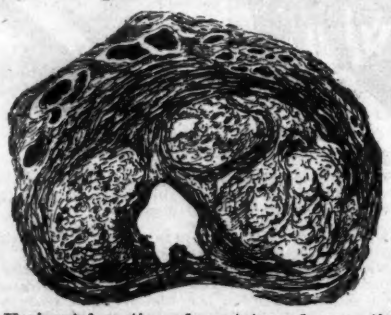

Fig. 7.—Horizontal section of prostate and prostatic urethra. From a case dying without treatment of chronic lobular prostatitis (prostatic hypertrophy); showing disease involving both the lateral lobes and producing a false capsule around them. Note the situation of the large blood vessels of the prostatic sinus on the outer surface of the false capsule.

thick false capsule surrounds the lobes and their separate enucleation is most easy and most likely to be accomplished. The appearance in sections of the tissue removed is characteristic (Fig. 7).

4. *Nodular Enucleation.*

The nature of the false capsule is here again the determining factor in explaining the result achieved. In discussing the morbid anatomy of prostatic hypertrophy or chronic lobular prostatitis, it was pointed out that the change that led to the formation of the false capsule surrounding the gland was not confined to that region, but took place in a similar manner between individual spheroids. In those cases where the tissue removed is extracted in individual nodules of varying size, it will be

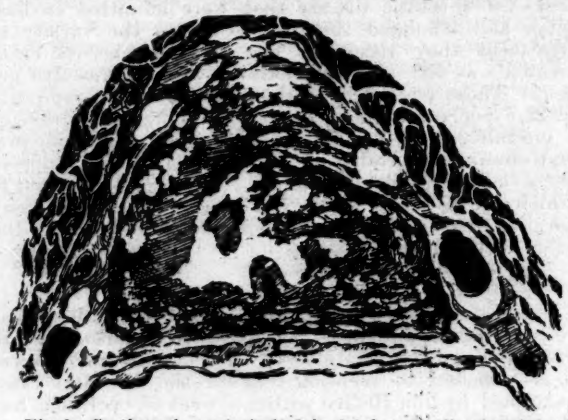

Fig. 8.—Section of prostatic bed in fatal case after prostatectomy, showing thick false capsule consisting of prostatic tissue that remains after "total" enucleation. The condensed tissue of the posterior lobe lies between the prostatic bed and rectum.

observed that the external false capsule is imperfectly formed, and the finger is in consequence deflected into the lines of separation that pass into the gland and separate the individual spheroids. It has already been mentioned that in addition to the case already described, the pelvic viscera of seven other cases that died after the operation of prostatectomy were hardened *in situ*, and serial sections made of the prostatic bed and neighbouring viscera (Fig. 8). Certain of these illustrated some of the complications with which the operation may be associated. In only one of the eight fatal cases examined were the ejaculatory ducts found to be seriously damaged. In five of the eight the false capsule was torn, and the pericapsular space infiltrated with blood and infected. In one case where a nodular removal was practised numerous fragments of diseased prostatic tissue had been left, and were seen projecting into the prostatic bed. In such a class of case it is not difficult to account for the liability for the obstruction to recur after the operation is recovered from. Microscopical examination of the prostatic bed of the eight cases showed it to consist of muscle and fibrous tissue and compressed gland acini, as already described, and in all cases it was the site of an acute suppurative process. In all cases small septic thrombi were present in the smaller vessels, and in two cases large septic thrombi were also present in the large veins of the prostatic sinus.

The question may now be considered whether a total extracapsular complete enucleation of the prostate gland is ever accomplished by blind finger dissection in the course of the operation of suprapubic prostatectomy. In certain anatomical textbooks the student is led to believe that this is what the surgeon aims at and usually accomplishes. Thus, for example, the most popular student textbook of anatomy states:

> Immediately surrounding the prostate, and quite independent of the sheath, is the fibrous capsule of the prostate. This capsule varies in thickness, in some cases being extremely thin, in others forming a distinct cortex. In association with operations for the removal of the prostate, now frequently performed, it is important to notice that the capsule has but very slight connexion either with the venous plexus or with the sheath of pelvic fascia. It is on this account that the gland can be so easily shelled out from its surroundings.

So far I have only obtained one specimen of this nature. It was presented to me by a graduate, and in addition to the complete prostate the seminal vesicles had been removed along with portions of the vasa deferentia, which hung like tentacles to the specimen. When the specimen was sectioned it showed the gland to be the site of chronic interstitial prostatitis. I was informed that it was removed with the utmost difficulty. This was not surprising. No further history was obtainable.

Cases are, however, not rare where a partial extracapsular removal has been carried out. In the operating

theatre these are difficult cases, and when the specimen is examined after removal portions of striped muscle fibre are found on its surface and a portion of one of the veins of the prostatic sinus may be adherent.

From the lower apex of the gland a tongue of tissue frequently projects, which contains muscle fibres derived from the external vesical sphincter. These are usually either cases of diffuse chronic lobular prostatitis, where no spheroids are formed, or combined lobular and interstitial prostatitis, or cases of early carcinoma (Fig. 3). The case from which this last specimen was obtained terminated fatally, and the *post-mortem* examination showed the false capsule to have been torn and early secondary carcinoma present in the lymphatics. I have not had the opportunity of examining *post mortem* a case of fibroid prostatitis treated by prostatectomy. If, in such a case, the prostate is enucleated, it is easy to deduce what is likely to result from what has been already described as the morbid anatomy of this disease.

Conservative Perineal Operation of Young.

In Young's operation the surgeon is afforded at the time of operation a full view of the dissection he executes, consequently the same dubiety as to the structures divided and removed does not exist. The material examined by me was obtained from 10 cases, all of which were operated on by myself. When the tissue removed was sectioned and examined microscopically it showed the lobes to be masses of tissue the site of chronic lobular prostatitis, and demonstrated the fact that the lobes were the product of no natural anatomical division of the gland, but resulted from the separation of a common mass of diseased tissue into three more or less artificial divisions.

The Choice of Operation based on the Pathology of the Disease.

In discussing this question we are met at the outset by the opinion already expressed when considering the pathology of certain "ideal" cases of advanced chronic lobular prostatitis, where it was said "that Nature would appear to have designed the parts for the operation of suprapubic prostatectomy." We will therefore consider the question from two standpoints: (1) The factors contributing to the relatively high mortality met with in those "ideal" cases, when treated by suprapubic prostatectomy, and how far it is possible to diminish this by the employment of other methods of operative treatment; (2) the danger of attempting to perform Freyer's operation of suprapubic prostatectomy in cases where the circumstances are not "ideal," the prostatism being due to other causes.

When the first question is considered, the facts concerning the cause of death after suprapubic prostatectomy already mentioned should be borne in mind. It has been already shown that the "ideal" case was the large "adenomatous" hypertrophied prostate, the site of chronic lobular prostatitis, where a large intravesical projection existed, and a thick, complete false capsule was formed. The damage to the patient's health during the period when this mass of tissue was ripening for removal has been also shown; the local and general irreparable damage caused by the prolonged backward pressure on the bladder and kidneys due to the retention of urine have been described. The case may be "ideal" for suprapubic prostatectomy, but the health of the patient has become so permanently impaired that any operation is now to him a most dangerous procedure. The factors that are liable to be the immediate cause of death in such a case have been shown to be: (1) Local infection arising out of the wound inflicted—for example, pelvic cellulitis, suppurative cystitis, consecutive suppurative nephritis, and under this heading may be included also reactionary haemorrhage. (2) The development of a distal septic focus such as bronchopneumonia. (3) Embolism, producing pulmonary infarction, which is always due to an associated infection. (4) Surgical accidents, such as fatal reactionary haemorrhage and peritonitis. (5) Uraemia, in cases where the damage to the kidneys before operation was so severe that, in the absence of other complications, this revealed itself as the sole cause of death. The underlying cause common to all is thus the weakened power of resistance owing to the prolonged disease. The dangers that are peculiar to suprapubic prostatectomy in an "ideal" case are the wounding of the space of Retzius and the consequent risk of septic pelvic cellulitis, and the risk of pulmonary infection with hypostatic congestion and pneumonia that is present when an elderly patient is confined to bed for some time, as is the general practice after suprapubic prostatectomy. The third risk is the difficulty of providing an efficient drainage of the bladder and prostatic bed so as to prevent a profound septic absorption from the stagnant septic urine that bathes the raw surface of the latter.

We may now ask how far these factors are avoidable by the choice of other means of treating the disease. The choice at our disposal lies between catheter life, the performance of a preliminary suprapubic cystotomy, or perineal prostatectomy. Catheter life may be dismissed at once as only justifiable in the hopelessly inoperable cases of this type. Preliminary suprapubic cystotomy is favoured by some on the grounds that it permits of a certain improvement in the patient's condition prior to the removal of the growth, and improves the condition of the septic bladder, but the value of it is doubtful. Page has shown how the mortality attending this line of treatment is relatively as great as that attending suprapubic prostatectomy, and it has further this disadvantage, that it does not get rid of the main risk of the operation where suprapubic prostatectomy is performed in an "ideal" case, which is pelvic cellulitis due to infection by way of the space of Retzius. A typical case is quoted below to illustrate this danger.

He was a man of 67, upon whom a suprapubic cystotomy was performed with the intention of its being preliminary to a suprapubic prostatectomy. On the night after operation the temperature rose to 103°, and remained high for nine days, when it fell to 100° F. He complained chiefly of pain in the upper part of the abdomen, and died suddenly on the tenth day. The abstract of the pathological record is: Enlarged prostate, backward pressure, pyelitis, pelvic suppurative cellulitis, early bronchopneumonia. The detailed description of the pelvic viscera shows how the pelvic cellular tissue was infiltrated by a thick greenish lymph, which extended up into the retro-abdominal tissues. This area of purulent infiltration extended from the space of Retzius, which had been wounded in the natural course of opening the bladder. The purulent infiltration reached as far as the lower pole of the right kidney. The prostate was increased in size, with a nodule of prostatic substance projecting into the cavity of the bladder behind the urethral opening, and forming the so-called middle lobe of the prostate. This projection was covered with ulcerating bladder mucosa. The bladder wall was hypertrophied, owing mainly to an increase in the muscular coat. The mucous membrane had undergone chronic ulceration, and multiple villous-like projections of indurated mucous membrane projected from the surface. The ureters were somewhat dilated; their walls were hypertrophied and their mucous membranes showed evidences of recent catarrh. The pelves of both kidneys were dilated and showed signs of recent acute catarrh. There was no evidence of suppurative nephritis; there was some chronic interstitial nephritis.

Where perineal prostatectomy according to Young's method is employed for the treatment of this "ideal" case, it is of course associated with risks peculiar to itself, but with it there is naturally no risk of infection of the space of Retzius, which is not damaged. The risk of pulmonary complications is much less, the patient being out of bed on the second or third day; and, finally, every impartial critic will grant that where the technique of bladder drainage is carried out according to the directions laid down by Young, the drainage is as near "ideal" as is possible to achieve, and there is no retention of stagnant septic urine in the bladder and prostatic bed. The unavoidable risks peculiar to Young's operation in such a case are the greater length of time occupied by the operation and the risk of infection of the pelvic cellular tissue planes owing to the opening of the lymph paths when the space of Denonvillier is opened into. This latter would appear, however, to be more a theoretical than actual danger, as it has not been encountered by Young in his numerous cases, and in my very limited experience of ten cases it has never been encountered. The reason for this would appear to be that the time when infection is liable to gain entrance to the cellular tissue is during the hours immediately following the infliction of the wound, before Nature has had time to create the natural protective barrier; and during this period in Young's operation the bladder drain and gauze packs in the prostatic bed prevent the entrance of septic urine in such quantity as to lead to a cellulitis. When the gauze

packs and bladder drain are withdrawn, by the end of the second day, the free dependent drainage prevents septic material accumulating. The importance of this latter fact appears to me to be borne out in my limited experience, where I have noticed how liable such patients are to have a slight rise of temperature and other indications of ill health about the end of the first week after operation—at that period when the external skin wound is closing, but still a day or two before the urine comes by the natural channel. During this brief interval Denonvillier's space is liable to be distended with septic material for the first time during the course of operation. This passing phase of septic absorption, if my explanation be correct, bears out the well-known surgical dictum: "That man does not die from sepsis on a free surface; it is the confinement of sepsis that the surgeon fears after operation."

The avoidable risks peculiar to perineal prostatectomy are probably more dreaded by certain surgeons. The reality of them no one familiar with the operation will gainsay. None of them are, however, such as to be likely to lead to a fatal issue. The position as regards the operative treatment of the "ideal" case of prostatic hypertrophy due to chronic lobular prostatitis may, therefore, be briefly stated to be that the simplest, most rapid, and, speaking broadly, the safest method of treatment is Freyer's operation. When it is performed it is of the utmost importance that the skin wound should not be sutured, so as to minimize the risk of prevesical infection. Efficient drainage of the bladder and getting the patient out of bed as early as possible are of equal importance. Perineal prostatectomy in such cases, in skilful hands, may produce an equally good result, but is more liable to be followed by such post-operative complications as stricture, fistula, or partial incontinence. In the hands of those unfamiliar with the accurate steps of the operation and its after-treatment, it is a much more dangerous method of treatment for this class of case. Thus on practical and theoretical grounds we may reaffirm that Nature would here appear to have designed the parts for the operation of suprapubic prostatectomy.

The Operative Treatment of Cases of Prostatism where the Disease is not Ideal for Suprapubic Prostatectomy.

We have seen how in this class there are included: (1) Cases of chronic lobular prostatitis or prostatic hypertrophy without glandular enlargement; (2) cases of chronic lobular prostatitis without intravesical projection; (3) cases of chronic lobular prostatitis without the formation of a complete false capsule; (4) cases of chronic interstitial prostatitis where the disease is generalized or has led to the formation of a median prostatic bar; (5) cases of carcinoma of the scirrhous type or involving the capsule.

The danger of attempting to perform Freyer's operation in such cases is known to every surgeon who has endeavoured to do it. At the same time it should be remembered that Freyer's position as regards such cases is perfectly clear. In speaking of cases suitable for suprapubic prostatectomy, he says:

> In patients in the earlier stages of the malady in whom not more than an ounce or two is found on introducing the catheter, it is inadvisable to attempt the removal of the prostate, because the enlargement of the organ will not have sufficiently advanced to render it prominent in the bladder or to define adequately the lines of cleavage between the true capsule of the prostate and its enveloping sheath. When we have to deal with adenomatous enlargements of smaller dimensions, say less than 1½ oz. in weight, the greatest difficulties present themselves as to the possibility of their enucleation entire being practicable.

It is important to bear in mind, however, in addition to early cases with a smaller quantity of urine, the most pronounced cases of prostatism with the severest degree of backward pressure are frequently met with in cases where the prostate is not enlarged or only slightly so, and where the gland in consequence maintains its normal relationship to the surrounding structure. In treating such cases, therefore, the courses open to us are: (1) To delay and wait for the gland to ripen to the maturity necessary for the satisfactory performance of suprapubic prostatectomy, a procedure surely unwarranted as a sound surgical practice in the light of the damage done to the urinary tract and the whole body by delay. (2) To endeavour to enucleate the gland by suprapubic prostatectomy. (3) To seek in another operation a satisfactory means of treating such cases. The risks associated with the second course where suprapubic prostatectomy is practised in the types of disease mentioned are numerous, and have been already referred to. Thus, in chronic interstitial prostatitis and advanced carcinoma, the operation is practically impossible. Its attempted performance is advised by no surgeon of standing, but, at the same time, cases have occurred where it has been attempted, and I have referred to one where a complete extracapsular removal of the entire gland was achieved by this means. The dangers of such a procedure are too obvious to warrant repetition.

Where glandular hypertrophy without intravesical projection is present, it can of course be diagnosed by cystoscopic examination, or, better still, examined with a urethroscope such as Wossidlo's or a cysto-urethroscope. I am afraid, however, that in many cases it is only when the bladder is opened that the condition is discovered. Suprapubic prostatectomy in such a case necessitates damage and probably destruction to the internal vesical sphincter. It is likely also that in these cases the line of cleavage between the area of disease and false capsule will be more difficult to find. The result is the operation is much more difficult and the extracapsular lymph space will probably be opened into, and the grave risk of septic pelvic cellulitis encountered in consequence.

There remains, lastly, the case where the false capsule is imperfectly formed to be considered. I claim to have already shown that these cases are occasionally met with, and we have seen how, when suprapubic prostatectomy is done in such cases, the tissue is removed, usually in fragments, with the risk of leaving portions as possible future causes of obstruction. In this class of case, again, the dangerous lymph area between the capsule and sheath may be opened into. We may therefore consider that in all the classes of cases mentioned Freyer's suprapubic prostatectomy is unsuitable.

THE OTHER OPERATIVE PROCEDURES SUITABLE FOR THESE CASES.

Those comprise: (1) Perineal prostatectomy; (2) division of the median bar by Bottini's galvano-cautery or its modifications, or by Young's more recently introduced prostatic punch; (3) suprapubic transvesical prostatectomy by the transperitoneal route or extraperitoneal with visual dissection. The scope of the second variety of operative treatment where the cautery or punch is used is clearly defined. They are the procedures of choice for cases of chronic interstitial prostatitis, especially with median bar formation.

Perineal Prostatectomy.

Cases of chronic lobular prostatitis (prostatic hypertrophy) without glandular enlargement are particularly suitable for this operation. In this type of disease the false capsule was well formed in the cases I have examined. The entire gland, however, is situated below the bladder floor and separated from that cavity by its mucous and muscular coats. By means of the operation of perineal prostatectomy, if properly executed, the area of disease may be entirely removed without damage to the internal or external vesical sphincters. If, at the same time, the surgeon, following Young's instructions, cuts deeply into the individual lobes by the incisions made parallel to the course of the prostatic urethra, the compressed tissue of the posterior lobe will be divided and the line of natural cleavage reached that allows of the easy removal of the diseased tissue in the separate portions described as lobes by Young. It has appeared to me that the importance of making this incision of a necessary depth in all cases where Young's operation is performed, so that the posterior lobe is divided completely, is perhaps not always fully appreciated when this operation is performed, and it is rendered much more difficult in consequence owing to the natural line of cleavage not being reached by the shallow cut made.

Where perineal prostatectomy is done for cases of chronic lobular prostatitis with general enlargement without intravesical projection or with an imperfectly formed false capsule the dual sphincter can always be conserved. The absence of the false capsule will of course render the removal more difficult, but as this is an operation whose technique is that of a visual dissection and not a blind finger enucleation, as in the suprapubic operation, this

difficulty is not anything like so serious. Further, the wounding of the extracapsular lymph space which is liable to occur and was referred to as a serious complication in the suprapubic operation is not here of serious consequence, because owing to the reasons already given the space is not liable to the same degree of septic infection, and the drainage it receives is so thorough as to mitigate against the risk of cellulitis arising from this cause. If the large veins beneath the sheath are wounded, the bleeding vessel can be seen and controlled by ligature and serious haemorrhage thus prevented.

The treatment of carcinoma by perineal prostatectomy has been shown by Young to be possible even in those cases where the capsule and base of the bladder are invaded. If the tumour is adherent to the rectum behind, the risk of damage to the bowel is correspondingly very much increased. Young has removed the entire gland along with the seminal vesicles and a portion of the bladder floor, a procedure impossible by the suprapubic route. It is only fair, however, to remember, when considering the treatment of prostatic carcinoma, that in many cases the disease, when early, has been removed with ease by Freyer's operation. This has, however, been accomplished when the malignant nature of the growth was clinically unsuspected, and usually owed its success to the co-existence of chronic lobular prostatitis, upon which the malignant process had supervened. This latter fact is a further reason for advocating early operative interference in all cases of prostatic dysuria, and it does not directly influence the question of the treatment of the disease when clinically recognizable. I think most will agree that in the light of the pathology of prostatic carcinoma and the results obtained by Young, Willan's advice, as given in his recent article, is unduly pessimistic, when he recommends that where a diagnosis of cancer of the prostate has been made clinically the performance of a radical operation for the removal of the disease is not to be recommended. When 20 per cent. of cases of prostatic enlargement or obstruction in old men are recognized as clinically due to carcinoma, such advice is surely unwarranted.

Suprapubic Transvesical Prostatectomy by the Open Method.

This method of treating prostatic disease is being more generally practised in recent years. It is possible that when visual accurate dissection has replaced blind enucleation, an "ideal" operative technique for the treatment of the above varieties of prostatic disease may be elaborated by this route. Accurate removal and perfect control of haemorrhage would thus be possible. On the other hand, however, it is obvious that if the route is transvesical it must necessitate serious damage to the bladder in many cases to reach an organ that is frequently entirely extravesical in situation. How far this can be made good by reparative plastic surgery as a final procedure in the technique of such an operation can only be conjectured.

Conclusions.

The conclusions as regards the treatment of prostatism from the standpoint of the pathology of the diseases causing it appear to me to be:

1. Three outstanding varieties of disease lead to prostatism: (*a*) Prostatic hypertrophy or chronic lobular prostatitis. (*b*) Prostatic fibrosis or chronic interstitial prostatitis. (*c*) Prostatic carcinoma.
2. The first is by far the commonest cause of prostatism, and was present in 82 per cent. of the specimens examined.
3. Chronic lobular prostatitis is, in my opinion, a senile hyperplasia, an aberrant overgrowth of tissue that is not the result of the appearance of an independent new growth, but is liable to develop into the same.
4. Chronic lobular prostatitis in the majority of cases produces prostatic hypertrophy.
5. It virtually always develops in the middle lobe, and is almost uniformly confined to the middle and lateral lobes.
6. The gland in consequence undergoes changes that usually permit of its easy removal by suprapubic prostatectomy.
7. Chronic lobular prostatitis may develop in and be confined to the anterior lobe, this being noted by me in one case.
8. Chronic lobular prostatitis may cause prostatism without enlargement of the organ, intravesical herniation, or complete false capsule formation.
9. In these cases the performance of suprapubic prostatectomy is difficult and dangerous.
10. The successful performance of suprapubic prostatectomy depends on the presence of an advanced type of prostatic hypertrophy due to chronic lobular prostatitis.
11. The recognition of this is clinically frequently very difficult.
12. When a patient with this advanced type of disease is operated on, his urinary tract and general health have usually suffered serious damage from the disease.
13. It is therefore unjustifiable to delay operation in an early case of chronic lobular prostatitis in order to permit of the gland undergoing those hypertrophic changes that facilitate its easy removal by suprapubic prostatectomy.
14. The mortality attending suprapubic prostatectomy is mainly due to the impaired health of the patient prior to operation.
15. The actual cause of death in such cases is usually a local infection arising out of the wound inflicted.
16. The operation of suprapubic prostatectomy by blind enucleation is unsuitable in cases of prostatism due to other causes than advanced chronic lobular prostatitis.
17. Perineal prostatectomy is a most suitable operation for such cases.
18. Perineal prostatectomy permits of the removal of the disease when its presence is diagnosed in all cases. It is, therefore, at present the operation that offers the best prospect of further advance in the treatment of prostatism.
19. For its successful performance an accurate knowledge of the anatomical structure and relationships of the prostate are necessary, as well as an understanding of the pathology of the disease.
20. The suprapubic transvesical method of prostatectomy by visual dissection offers the prospect of developing into a method of treating prostatism that may ultimately warrant its adoption in a large number of cases.
21. Chronic interstitial prostatitis is best treated by division and removal of the constriction by the transurethral route.
22. Prostatic carcinoma may be in an early case clinically indistinguishable from hypertrophy due to chronic lobular prostatitis.
23. This fact is, therefore, a further reason for early operation in all such cases.
24. Prostatic carcinoma, when recognized clinically, may be successfully treated by excision of the gland in suitable cases.

I desire to record my gratitude to the President and Fellows of the Royal College of Surgeons of Edinburgh, in whose laboratories this research was conducted.

I wish to thank also many of my senior colleagues, and especially Mr. David Wallace, for permitting me to use material from their private and hospital cases, and Dr. Shennan and the staff of the Pathological Department of the Royal Infirmary of Edinburgh, for the many willing services they have done for me in the course of this investigation.

NEURALGIA OF THE TWELFTH DORSAL NERVE SIMULATING VISCERAL LESIONS.

By T. K. Dalziel, M.B., C.M., F.R.F.P.S.G.,
Surgeon, Western Infirmary, Glasgow.

Neuralgia of the intercostal nerves has long been a well-recognized affection, sometimes troublesome to get rid of, but as a rule, under proper treatment, subsiding satisfactorily. The twelfth dorsal nerve, however, from its anatomical relationship and its distribution, presents features worthy of detailed consideration.

During the last twelve years there has frequently come under my observation neuralgia of this nerve simulating visceral lesions so closely as to lead to the performance of laparotomy; indeed, recently a lady came under my

observation whose ovary and appendix had been removed and her kidney excised, but whose only complaint was evidently that of neuralgia of the right twelfth dorsal nerve, as was shown by the complete relief obtained by the division of this nerve.

Why the neuralgia of the twelfth nerve should be so inveterate is probably explained by its anatomical relationships—pursuing its course from under the twelfth rib to above the pubis, piercing the different layers of the abdominal muscles, giving a branch over the crest of the ilium, which branch is necessarily readily injured accidentally or in the course of occupation where weights are carried on the haunch.

Conditions of unrest thus exist as are found in the case of the sciatic nerve, and the resultant neuralgia may be as serious, as far as incapacity to work or enjoy life, as is found in the latter case.

In this nerve, as elsewhere, the neuralgia attack may be mild and quickly passing; but in those cases, 22 in number, on which I have operated the condition had persisted so long and the pain was so great as to make the patient right willingly seek relief by operation.

The functions of the twelfth nerve being mostly sensory, one need have no hesitation in dividing it, though the patient occasionally complains of a sense of coldness and numbness in the region supplied by the nerve; but this, as a rule, soon passes off.

In regard to the areas of pain in such cases, three points will be generally found. A painful area immediately under the twelfth rib, by the outer border of the quadratus lumborum; another to the inner side of the anterior superior spine of the crest of the ilium; and, lastly, an area above and to the outer side of the pubis. We thus have pain suggesting kidney and ovary, and on the right side appendicitis.

Almost invariably an area of tenderness can be determined in the area supplied by that branch of the twelfth nerve which crosses the crest of the ilium. Tenderness in this area has been supposed to be associated with ovarian disease—an association, however, which is not very apparent when one considers the distribution of the nerves. It seems not improbable that many of these cases of ovarian neuralgia and appendix colic unrelieved by operation may really be due to neuralgia of this nerve.

The first case which came under my observation, now twelve years ago, was that of a man of 40, who had for fifteen years spent the greater part of his time as an invalid. He was a working man who in his occupation had frequently pressure on his left haunch. The pain at times was excruciating, with intervals of comparative comfort, but never such as to allow him to get into the full swing of work. He was on his way to the poor-house when sent to me for an opinion. There being no other apparent reason for his suffering apart from neuralgia, I for the first time exposed and destroyed the twelfth dorsal nerve, with relief so immediate and complete that within six weeks he was once more at work, and has continued well.

Another typical case is that of a girl aged 15, who complained of pain in the right side of five years' duration. Five years before admittance she was kicked in the right groin. Sickness and vomiting occurred, and she was confined to bed for a fortnight. There was pain on micturition, but no story of haematuria. At times she noticed a swelling in the right iliac region. Menstruation began at 12 years; at each period pain increased in severity, so much so that she had to stay in bed a day or so. On examination the abdomen was found to be normal, except over McBurney's point, which was tender to pressure.

January 28th.—Pain now confined to right lumbar region and right buttock. No pain in right iliac region.

February 7th.—Resection of twelfth dorsal nerve.

February 22nd.—Dismissed well.

It is unnecessary to multiply clinical cases similar to those described. I have records of 22 cases, all of which, with one exception, were cured by this operation on the twelfth nerve. The case where no relief was obtained had previously been operated on for kidney affection; the wound had suppurated, and in the cicatricial mass it was difficult to find the nerve, and no relief was obtained.

It seems probable that in some cases the ilio-hypogastric may be at fault, but this seems to me less frequent and less likely to occur than in the case of the twelfth nerve. The nerve can be easily exposed through a perpendicular incision by the outer border of the erector spinae.

THE SURGICAL TREATMENT OF INTESTINAL STASIS.

By Herbert J. Paterson, M.C., M.B.Cantab., F.R.C.S.,
Surgeon to the London Temperance Hospital.

Thanks to the brilliant advocacy of Sir Arbuthnot Lane, there is an increasing belief as to the necessity for surgical treatment in certain cases of marked intestinal stasis with symptoms of alimentary toxaemia.

In some cases stasis is due to obstruction by definite bands at the termination of the ileum, at the hepatic or splenic flexures of the colon, or in the neighbourhood of the colon. Whether these bands are of developmental or inflammatory origin is of academic interest. The practical point is that they do occur as definite pathological lesions, and are not, as some would have us believe, the figments of the mental kink of a disordered imagination. In other cases—and perhaps these are the more numerous—stasis appears to be due, as has been pointed out by Sir Arbuthnot Lane, to the control by the appendix of the effluent from the ileum into the caecum.

The symptoms produced by intestinal stasis fall into two groups—namely, those produced by obstruction, and those resulting from autointoxication (Lane). Frequently, in intestinal stasis, the prominent symptom is indigestion—that is, pain after food, flatulence, and sometimes vomiting. There are, I think, grounds for believing that these digestive troubles are due to interference with the secretion of the stomach by the action of absorbed toxins. My reason for this belief may be stated briefly as follows:

It is now recognized that in many cases of gastric trouble the *fons et origo mali* is in the appendix; the symptoms are referred to the stomach, but the lesion is in the appendix, a condition for which I have suggested the term "appendicular gastralgia." In many of these cases there is a complete absence of free HCl in the gastric contents. This absence of free HCl has been attributed to inflammatory changes in the gastric mucosa, as a consequence of delay and stagnation of food in the stomach. This explanation does not seem to be satisfactory. After removal of the appendix in these cases I have found in many instances that free HCl is present in the gastric contents although absent before operation. This observation seems to be fatal to the hypothesis that the absence of free HCl is due to inflammatory changes in the gastric mucosa. If the absence of free HCl were due to this cause, it is difficult to believe that after operation there could be an immediate restoration of the secretion of free HCl. This observation is a very striking one, and puzzled me for several years. I used to think that the absence of free HCl might be the result of spasmodic pyloric stenosis, secondary to the irritation of the diseased appendix, and that the removal of the appendix led to the cessation of the spasm of the pylorus, and consequent renewal of the secretion of free HCl. This view seemed to be disproved by the absence of pyloric spasm on *x*-ray examination, and by the observation which I have made a number of times that electrical stimulation of the appendix has no effect in producing pyloric contraction. The hypothesis that the diminution of free HCl in the gastric contents is due to the absorption of toxins from the alimentary canal explains in a reasonable manner the restoration of the secretion of free HCl by the gastric mucosa after removal of the appendix.

Vomiting may be a consequence of toxic gastritis, but when continuous and copious, may be due to a kink either at the junction of the stomach with the duodenum or at the duodeno-jejunal flexure, the kink being the result of the distension of the intestines. In the following case it is difficult to give any other satisfactory explanation of the copious and persistent vomiting which occurred. The patient was a young woman, aged 25, who was under the care of my colleague, Dr. Soltau Fenwick.

For six or seven years she had suffered from pain coming on immediately after food, accompanied by vomiting. Two years previously she was operated on for acute appendicitis, but the appendix was not removed. She gradually got worse, and had two attacks of haematemesis. The pain used to wake her up at night, and she was rarely free from it. With gastric lavage, rectal feeding, and rest in bed she improved for a time, but then began to get worse again, was readmitted, and at Dr. Fenwick's request I operated on her. No lesion was found in the stomach, but the caecum was enormously distended, and at one point bound down by adhesions. Ileo-colostomy was

performed. The patient remained well for three months, and then began to have copious and persistent vomiting accompanied by pain. She was readmitted and kept under observation for several weeks. Notwithstanding all treatment, the vomiting persisted to such an extent that it was difficult to understand how she continued to live and look as well as she did. At night the pain frequently kept her awake for hours. After further consultation with Dr. Fenwick I removed the whole of the colon and the terminal portion of the ileum. The patient made an excellent recovery, has been completely relieved of her symptoms, and feels better than she has done for years.

The simplest method of demonstrating intestinal stasis is to administer two teaspoonfuls of charcoal to the patient, and watch for the appearance of the charcoal in the stools. Non-appearance of the charcoal for seventy or a hundred hours is evidence of intestinal stasis. The site of the stasis and the presence of kinks can be demonstrated by *x*-ray examination, in the technique of which admirable work has been done by Dr. A. C. Jordan. I regard the charcoal test as a very valuable one, and I should hesitate to accept the evidence afforded by *x*-ray examination unless it were confirmed by the charcoal test.

Indications for Surgical Treatment.

When there is evidence of appendicular trouble, of definite kinks, or of obstruction by bands, clearly surgical treatment is indicated. Colicky pain and constant tenderness over the caecum and sigmoid are suggestive of mechanical obstruction. When the stasis is due to atony of the large bowel, or to a large mobile caecum, medical treatment must have had a prolonged and thorough trial and have failed before surgical treatment is considered. It is only in the really severe cases that surgical treatment is indicated. It is scarcely necessary to add that intestinal stasis *per se* does not call for surgical treatment unless it be accompanied by constant pain or by distinct signs of toxaemia.

Operative Treatment.

In a certain number of cases in which the appendix controls the effluent from the ileum into the caecum complete relief is afforded by appendicectomy. Whether this control is due to the appendix acting as a ligament and causing a kink (Lane), or, as seems to me more probable, to the diseased appendix causing spasm of the caecum and end of the ileum, is a question of secondary importance. The frequency with which in these cases faeces or definite concretions are found in the appendix seems to suggest that the hypothesis of spasm is the more probable. The contractile efforts of the appendix to empty itself into the caecum spread to the caecum and lower end of the ileum. Frequently I have seen the appendix contracting vigorously when touched during the operation of appendicectomy. That such a contraction occurs during life is suggested by the severe attacks of pain—the so-called appendicular colic—which may be caused by an appendix which has little wrong with it, except that it harbours a concretion.

My experience is that, after removing the appendix for appendicular gastralgia, about 85 per cent. of the patients gain complete relief. The remaining 15 per cent. continue to suffer from indigestion, due apparently to a chronic gastritis and absence of free HCl. Some years ago I discussed the question whether it is justifiable to perform gastro-jejunostomy in such cases in the absence of a definite lesion of the stomach. I expressed the view that it is not justifiable. Since then Sir Arbuthnot Lane has shed new light on these dark places, and now the indication seems to be that when, after appendicectomy in these cases, the symptoms persist and are of so severe a type as to necessitate further surgical treatment, it is a short circuit between the ileum and pelvic colon, and not between the stomach and jejunum, which is indicated.

In a few cases in which the ileum is bound down by a band of limited extent, it may be possible to divide the band so as to free the ileum completely. Care must be taken to cover over with peritoneum the raw surface left after division of the band. This method of treatment is of limited application. In some instances the results of this simple procedure are excellent, but in others the bands reform. If the membrane binding down the ileum be wide in extent, its division is a hazardous procedure, as it may be followed by paralytic intestinal distension, which may be alarming, and has, I believe, proved fatal in some instances. An ileo-colostomy is safer than extensive division of bands. Division of bands about the hepatic and splenic flexures is not followed by good results. Bands about the sigmoid, on the other hand, I have divided in a number of cases with excellent results.

Ileo-colostomy is a safe, and in the majority of cases a satisfactory, operation. The proximal end of the ileum may be anastomosed to the pelvic colon by an end-to-end or by a lateral anastomosis. Personally, I prefer the lateral method, because one of my patients upon whom I performed an end-to-side anastomosis, subsequently required a secondary lateral anastomosis owing to contraction of the original end-to-side union. It is asserted constantly that patients after ileo-colostomy suffer from troublesome diarrhoea. I can only say that I have never met with this complication. On the contrary, I find that as a rule such patients have to continue the use of liquid paraffin to ensure a regular action of the bowels. The only objection to ileo-colostomy is that sometimes the patients continue to have some discomfort or pain owing to reflux of faeces into the colon, or more probably to distension of the large bowel with gas. I have referred already to a case of this kind.

Just over 25 per cent. of my patients have suffered more or less from this sequel of ileo-colostomy. My experience may be exceptional, but if this trouble occur as frequently as this, it raises the question whether colectomy should be performed at the same time as the short circuit, to guard against the disappointment of an incomplete cure. A combined ileo-colostomy and complete colectomy is a big operation, and does not appear to me to be justifiable except in exceptional circumstances. For this reason I have adopted latterly a method of partial colectomy, which Dr. Mayo has informed me he has employed successfully in several of these cases. This method consists in dividing the ileum and anastomosing it to the transverse colon in an antiperistaltic direction, and then resecting the terminal portion of the ileum, the caecum, and the right half of the transverse colon. The advantage of this limited operation is that it may be performed in one stage with safety. The antiperistaltic anastomosis renders the closure of the gap between the large and small intestine considerably easier than when an isoperistaltic union is made. So far as my limited experience goes, the results of this operation have been very satisfactory, and if time confirms this view it would seem to be preferable to a simple ileo-colostomy.

The technique of the operation is as follows:

The abdomen is opened in the middle line. The ileum is crushed and ligatured two inches from its termination. A pair of forceps is placed on the ileum distal to the ligature, and then the intestine is divided by the cautery between the ligature and the forceps, the division being extended into the mesentery for half an inch. I prefer to leave the invagination of the proximal end of the ileum until after the anastomosis of the colon has been effected, as by doing so one is able to regulate the amount invaginated so as to leave no part of the blind end projecting beyond the limit of the anastomosis.

The proximal end of the ileum is now anastomosed to the transverse just to the left of the middle line, the anastomosis being antiperistaltic. The ligatured end of the ileum is now invaginated by means of a serous suture so as to leave the blind extremity almost flush with the end of the anastomotic opening. Two pairs of crushing forceps are placed on the transverse colon in the line of the pylorus, and the gut is divided between the forceps with the cautery. The distal end of the transverse colon is closed by a serous suture passed over the forceps, so that when the forceps are removed the simple act of pulling the two ends of the suture tight invaginates the mucous surfaces into the bowel. The right half of the transverse colon, the ascending colon, the caecum, and the terminal portion of the ileum are now removed after ligature of their blood vessels. The free edge of the ileal mesentery is sutured to the great omentum, so as to leave no aperture through which intestine may prolapse. The abdomen is closed without drainage.

I think that this modified operation deserves an extended trial in those cases of intestinal stasis in which surgical treatment is necessary. Examination of the large intestine after removal supports the view that the caecum is the "cesspool" of the alimentary tract. In one of my cases I found, on opening the caecum after the operation,

putrid faeces mixed with bismuth which had been taken thirteen days before the operation. My experience of this operation is at present limited to 6 cases. All the patients recovered, 5 of them have been relieved completely, and the remaining patient is much better, but the operation is too recent to regard it as a cure.

The following case illustrates the use of this operation, and I think you will agree with me that operation was not entered on "lightly, inadvisedly, or wantonly." I have not performed an ileo-colostomy or colectomy on any patient without having had them under observation for five or six months, and in the great majority I have tried first the effect of removal of the appendix or the division of bands.

The patient was a young woman aged 22 years, who some years ago came under the care of my colleague, Dr. Soltau Fenwick. She had suffered from indigestion for many years. Four years before admission she began to suffer from pain after food, lasting until she vomited. This pain came on in attacks, some of which lasted for several months, although in between the attacks she suffered from flatulence and a heavy feeling after food. During the attacks the pain used to wake her up at night. At times the pain was so severe that she was doubled up with it. She had been in hospital previously for two months and was treated by gastric lavage.

At the time of her admission, under Dr. Fenwick, vomiting was almost constant. She could keep nothing down except soda and milk, and even this gave her pain. Constipation was very marked. Drugs appeared to have no effect. If charcoal was administered it was still unpassed at the end of a week. She was treated by gastric lavage and fed per rectum. After four weeks' treatment she improved, but two weeks after her discharge she was readmitted on account of the vomiting, although the pain was better. As she was no better after four weeks' further treatment, Dr. Fenwick asked me to open the abdomen with a view to removing the appendix. At the operation the appendix was found to contain three oval concretions and the mucosa was ulcerated. No abnormality was found in the stomach or gall bladder, but the caecum was large and mobile. After the operation she was better for a few weeks, but after she left hospital, although the pain almost disappeared, she continued to suffer from vomiting and extreme constipation. She was treated at home for several months with gastric lavage and liquid paraffin, but the vomiting continued. Six months after her discharge she was admitted once more into the hospital. Again she was fed rectally, but she could keep no food in her stomach except peptonized milk. Any other kind of food produced vomiting immediately, and even when on peptonized milk she had vomiting occasionally. After three months' medical treatment she was no better, and as she was steadily losing weight we agreed that the only course left was to short-circuit the colon. Accordingly I performed partial colectomy in the manner described. The patient made a good recovery and has remained quite well. Now, for the first time for ten years, she can eat all kinds of food and she has had no more vomiting. She says that her friends regard her as "resurrected."

The lot of those who suffer from the effects of intestinal stasis is so unenviable that it is our bounden duty seriously to consider all forms of surgical treatment, so that we may come to a decision as to the best procedure to be adopted in order to restore to the victims of this disorder their bodily and mental vigour and so enable them to resume their usual vocations and to enjoy the pleasures of life.

A CASE OF RETROPERITONEAL FIBROMA, WEIGHING 34¾ POUNDS, SUCCESSFULLY REMOVED.

By CHARLES P. CHILDE, F.R.C.S.,
Senior Surgeon, Royal Portsmouth Hospital

THE following case (with specimen produced) appears to be of sufficient interest to bring before the Section. G. T., schoolmaster, aged 48, consulted me on March 28th, 1912.

History.—Family history unimportant. No previous illness of any severity. Had suffered at times from constipation and "bilious attacks."

Present Illness.—Began about five years before with gradual enlargement of the abdomen. The swelling increased rapidly during the last year. During this time the constipation and "bilious attacks" from which he had previously suffered ceased. The only pain complained of was a sense of great discomfort owing to the size of the abdomen. No bladder trouble. Though he became considerably thinner during the last year, his weight increased from 11 st. 3 lb. to 12 st. 3 lb.

Condition Present.—The patient was very thin and rather sallow. An enormous tumour occupied the abdominal and pelvic cavities, completely filling them, and extended into both loins. Owing to its entire occupancy of the cavity it was impossible to move it at all, or to obtain any information as to its site of origin. On palpation it was firm and solid, with some bosses of stony hardness. (These turned out to be masses of ossification.) The measurement at the umbilicus was 41½ in., above the umbilicus 41¾ in., and below it 41 in. The heart, lungs, and kidneys were sound, and the tongue was clean.

Diagnosis.—On the first examination the fixity and stony hardness, combined with the rapidity of increase latterly, gave the impression of malignancy supervening on an innocent growth; but the total length of duration, combined with the fact that, though very thin, the man did not appear to be in an advanced stage of malignancy, pointed against it. His increase in weight was no doubt due to the growth of the tumour, for the rest of his body was very wasted. I induced him to allow me to make an exploratory incision.

Operation.—On March 31st, 1912, a median incision was made. The intestines were found packed away beneath the diaphragm, and the tumour was ascertained to be retroperitoneal. The posterior layer of peritoneum was divided and the most superficial lobule was shelled out. It was seen to contain some lobules of fat, and felt to contain some bone or calcareous matter. The incision was therefore prolonged from the ensiform cartilage to the pubes, and enucleation was proceeded with. Very large veins coursed over the surface of the tumour. Owing to the manner in which the tumour had insinuated itself everywhere—into the pelvis, far back into the loins, and

upwards beneath the diaphragm, making it almost impossible to insert a finger between the growth and its surroundings, the enucleation was exceedingly difficult. Besides, while working in the dark at the back of the tumour, great gentleness had to be exercised to avoid tearing one of the large veins, iliacs or vena cava, which would have been an awkward accident. When the tumour was partly got out it took two assistants to hold it and shift it from side to side while the deeper lobules were extricated from their bed. The operation occupied three hours. The tumour was eventually found to grow from the capsule of the left kidney, which had to be stripped off with it. The abdominal organs, after removal of the tumour, appeared healthy, and the abdomen was closed. Very little shock followed the operation, and an uneventful recovery ensued. The post-operative temperature did not rise beyond the normal. He has remained quite well.

Clinical Research Report.—The tumour is a fibroma, with considerable myxomatous areas. There are areas of ossification in it, or, more probably, in its capsule, and some adipose tissue is present, which we conclude is perirenal in origin. No cartilage, muscle, or other type of tissue is present, and there is no evidence of malignancy.

Remarks.—The chief interest lies in the enormous size of the tumour. One would hardly conceive it possible that a tumour of this size and density could cram itself into the retroperitoneal space, and that, too, without causing any pressure symptoms. In fact, "bilious attacks" and constipation, formerly present, disappeared with the growth of the tumour. The intestines were very empty. I imagine they had to keep themselves so. There was no room for accumulations of faeces and gas. A fortuitous circumstance was that the tumour, from its extreme hardness and absolute fixity, was not considered inoperable without an exploratory laparotomy.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

THE ETIOLOGY OF BERI-BERI.

In the British Medical Journal of June 14th, 1913, there is a memorandum by Mr. E. G. Fenton, who directs attention to the possibility that factors other than the consumption of polished rice are concerned in the causation of beri-beri. In the Journal of July 5th, 1913, there are memoranda by Dr. Lindsay and Dr. Laidlaw on the same subject.

In the various publications which from time to time we have issued on the etiology of beri-beri, attention has repeatedly been drawn to the fact that the problem presented to us in 1906 was to determine the cause of this disease as it occurred in the Federated Malay States and Straits Settlements.

The observations and experiments which we carried out enabled us to state in 1909 that beri-beri, as it occurs in the countries with which we are concerned, is caused by the continuous consumption of polished rice as the staple of diet. Since that date further and complete confirmation of the accuracy of that statement has been obtained, and it is now beyond dispute that the etiology of beri-beri in the Federated Malay States and Straits Settlements has been demonstrated. From reports received we believe that in Siam and the Philippine Islands this disease is of similar origin.

We are not acquainted with any systematic observations and experiments having been carried out in either Southern Nigeria or Brazil which would permit of a conclusive statement being made on this subject so far as these countries are concerned. We sympathize with our colleagues in their doubts, but we disclaim all responsibility for the wide sweeping statements and generalizations which have been made by writers who have had no experience of the disease.

Facts have been determined by us, and if we were in a position to apply the knowledge gained beri-beri would cease to exist in this country, but those who are familiar with the difficulties of applying scientific results in actual practice will appreciate the position.

While fully recognizing the very valuable work which has been done by those investigators who have sought to isolate the important substance or substances contained in the subpericarpal layers (not, as stated by Mr. Fenton, in the pericarp, which is valueless) we cannot but regret the tendency of most recent writers to exalt the importance of *polyneuritis gallinarum*, and to ignore the human disease. The fact that polished rice, when forming the staple of diet in man, produces beri-beri, rests on quite other evidence than that produced by experiments on domestic fowls.

To those who would seek to advance our knowledge of the causation of beri-beri in other countries, we would suggest the necessity of determining that the disease known to them as beri-beri is the same as the disease which is known by that name here. After all, beri-beri is only a form of polyneuritis.

A survey of the voluminous literature which concerns itself with this disease will show not only that forms of polyneuritis of different origin have been called beri-beri, but that even diseases of which polyneuritis may not be a prominent feature—such as "epidemic dropsy," "Ceylon beri-beri," and the like—have been included under this name. It is not to be expected, therefore, that any single etiological factor will satisfactorily explain all the recorded outbreaks of so-called beri-beri.

H. Fraser,
A. T. Stanton.

Institute for Medical Research, Kuala Lumpur, Federated Malay States.

I happened to be medical officer in 1901–2 (attached R.A.M.C.) to the prisoners of war camp and hospital at Deadwood, in the island of St. Helena. There was an outbreak of beri-beri, which affected about 60 per cent. of the Boer prisoners. Etiologically we were puzzled to account for it, the rice and fish theories had to be discarded, as the Boer at home does not live on these articles of diet to any extent, nor did they figure in his dietary at Deadwood. They were free from the disease on arrival. Eventually we discovered that the land on which the prisoners' tents were pitched had formerly been a camping-ground for Indian coolies and negroes, employed at road-making and house-building by the British East India Company. These coolies possibly brought the disease with them from India. This would be some time in the Twenties, as the company was broken up and their fleet of ships sold in 1832. It was a far cry from 1902, but it suggested one way of accounting for the visitation, namely, that the infection had come from the ground, the micro-organism being dormant there all those years. The ground was not at all of a marshy character.

A story told me by an old resident on the island—a farmer with whom I was on friendly terms—has, I think, a significant bearing on the soil emanation infection theory. This gentleman, Mr. K., when a lad of ten rode out with his father one morning, and, when a mile or so from home, suddenly came on about a score of men's heads "sticking out of the ground." There was a man walking to and fro amongst the heads, applying a big bottle to the lips of each in turn. The uncanny picture so terrified young K. that he did not wait even for his pony, but turning his back, and at the same time a deaf ear to his father's reassuring shouts, ran crying all the way home to his mother. He learnt later that those heads belonged to beri-beri patients, the initial step in whose treatment consisted in their being interred in Mother Earth, their heads only showing above the surface. As Mr. K. quaintly remarked: "They buried them all for a start, and the fellows who did not die were dug out again and sent back to work."

When this old ground was condemned and the camp moved to a fresh field, there soon appeared a marked improvement in the general health, practically all recovering. It was notable also that there was no case of beri-beri amongst the troops, some of whom were quartered not far from the original prisoners of war camp.

Singapore. James P. Casey, L.R.C.S., L.R.C.P.

CAESAREAN SECTION FOR ACCIDENTAL HAEMORRHAGE.

About 2 a.m. on June 29th I was called to see Mrs. R. L., aged 34, who was expecting her first baby at the end of August. Her husband, who came for me, said she was sick, losing blood, and as white as a sheet. I found her very pale and complaining of considerable pain. The pain had commenced in the left groin nearly two hours before I saw her. Half an hour after its commencement she began to lose blood. The haemorrhage soon became profuse, and her discomfort was increased by vomiting. The pain became worse in the left groin, spread to the right side and then all over the abdomen. I saw at once that the haemorrhage was alarming, but there was no dilatation of the os uteri. I gave her a hypodermic injection of morphine and atropine, and remained with her for three hours. I then left her and returned after an interval of three or four hours. On my second visit I found the pain had been more severe, and she was still losing a considerable quantity of blood.

I had her removed immediately to a nursing home, and about thirteen hours after the onset of symptoms opened the abdomen. I found quite two pints of blood in the peritoneal cavity. The uterus looked like a thick-walled ovarian cyst with twisted pedicle. I incised the uterus and removed a well-developed seven months male child, dead. The placenta was almost central in position in the fundus, but rather to the left, and had been detached to the extent of 2 square inches. At one part the uterine wall was almost as thin as ordinary writing paper, but I discovered no rent and wasted no time in searching for one. The surgeon assisting me suggested that I should remove the uterus, but I did not act upon his suggestion. My patient, who was profoundly anaemic before the operation and had a pulse of 128, made an excellent recovery, and left the home just within the month. A week later she menstruated.

I decided upon Caesarean section in this case because at the end of nearly twelve hours there was almost no sign of any dilatation of the os, and dilatation by any of the methods usually adopted for inducing labour would have been tedious. Further, she had already lost so much

blood that speed was necessary to save her life. As things turned out, even speedy delivery by the vagina would not have saved her. I diagnosed the condition as one of placenta praevia. I was wrong, but I am convinced that Caesarean section would be the most speedy and successful method of dealing with a case of placenta praevia where the cervix is rigid and the haemorrhage severe.

JOHN IRVING, M.B.,
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Reports
ON
MEDICAL AND SURGICAL PRACTICE IN HOSPITALS AND ASYLUMS.

LONDON HOSPITAL.

PUERPERAL SEPTICAEMIA DUE TO BACILLUS COLI.

[Reported by W. P. BONNER, M.R.C.S., L.R.C.P.]

ON May 21st, 1913, a multipara was admitted into the London Hospital under the care of Dr. Russell Andrews. Five days previously she had miscarried at the second month of pregnancy. There was no medical attendance until two days later, when a doctor was called in because the patient complained of bearing-down pain in the lower abdomen. The doctor kindly wrote to me saying that "On examination I found the placenta presenting, but so adherent that I could only remove a small part of it with the finger. The temperature and pulse were normal." "On the following day the condition was the same."

On admission the patient was a little pale, otherwise her general condition was good. Temperature 100°, pulse 80. Lochia very scanty in amount. There was no laceration of the vagina or cervix uteri. The uterus was about the size of a large fist, fairly firmly contracted and freely movable. Cultures were taken from the interior of the uterus by a method similar to that used by Menge and Krönig, and grew colonies of *Bacillus coli* and a few Gram-positive cocci in groups. The blood gave pure cultures of *Bacillus coli*.

The treatment of this case was: On the night of admission a general anaesthetic was administered, the interior of the uterus explored, and an offensively smelling piece of placenta removed from the posterior wall. A hot intrauterine douche (of ʒj of tincture of iodine to 1 pint of water at 118° F.) was given, and finally the interior of the uterus carefully swabbed over with 2 per cent. solution of iodine in rectified spirit. The patient was given a subcutaneous injection of ergot and put back to bed in Fowler's position, the head of the bed being raised 2 ft. On the following day four-hourly vaginal douches of diluted sanitas heated to 112° F. were commenced. The patient has made a rapid and complete recovery.

The chief facts remarkable about this case are:

First, the rarity of this condition, "*Bacillus coli* septicaemia," as compared with that of streptococcal infection. Amongst the cases of puerperal septicaemia admitted into the London Hospital during the last eighteen months there have been at least 34 cases with positive blood cultures:

28	cultures of	Streptococcus	pure.
1	,,	,,	*Staphylococcus aureus*.
1	,,	,,	Anaërobic cocci.
1	,,	,,	Gram and diplococci.
1	,,	,,	Pneumococci.
2	,,	,,	*Bacillus coli*.

Secondly, the mildness of the symptoms as compared with the majority of streptococcal cases. In this case there was no history of any rigors, and on the day after the uterus was cleared out the temperature and pulse became normal, and have remained so ever since. At the end of the third week the blood cultures remained sterile, and the patient was so well in health that she left her bed, and a few days later went away to a convalescent home.

I am indebted to Dr. Russell Andrews for permission to publish this case, and to Dr. G. T. Western for the bacteriological investigations.

Reports of Societies.

MEDICAL SOCIETY OF LONDON.

AT a meeting on October 13th Sir DAVID FERRIER gave a presidential address on the *Cerebro-spinal fluid in health and disease*. There existed, he pointed out, a system of canals continuous on the one hand with the pericellular or perineuronal spaces, and on the other hand with the subarachnoid space. These played an important part in the nutrition of the brain cells, probably forming the medium of interchange between them and the blood in the capillaries, giving up water and carbon dioxide and taking up oxygen and sugar. Of greater importance from the point of view of pathology was the fact that the subarachnoid space was continuous with the sheaths of investment of the cranial and spinal nerves, and through these entered into communication with the peripheral lymphatics, thus furnishing a means of entry for organisms and toxins into the central nervous system. The cerebro-spinal fluid was being continually secreted, and was continually escaping. It did not exceed in amount a few ounces at most. If allowed to escape it was secreted more copiously. Normally, the cerebro-spinal fluid escaped both by the lymphatics and by the veins; but the chief exit, as had been shown by the experiments of Leonard Hill, was the venous sinuses of the dura mater. It was held by Key and Retzius that the escape took place by way of the Pacchionian bodies, which are merely polypoid proliferations of the subarachnoid tissue which insert themselves into the venous sinuses of the dura mater and diploë. Cushing, however, was of opinion that a more direct communication existed between the subarachnoid space and the longitudinal sinus. Most physiologists were agreed that the cerebro-spinal fluid was secreted by the choroid plexuses, but though it was obviously a secretion, the cells of the choroid plexus offered remarkable resistance to the passage into the fluid of most substances that might be introduced into the circulation; urotropin, chloroform, and alcohol were among the chief exceptions. On the other hand, drugs and toxins were absorbed *from* the cerebro-spinal, and produced their characteristic effects with as great if not greater rapidity than when introduced directly into the circulation. The speaker then considered in detail the composition of the cerebro-spinal fluid, mentioning that it contained the active principles of the secretion of the pituitary gland, which it would thus bring into immediate contact with the spinal tissues. He spoke of the mechanical effects subserved by the cerebro-spinal fluid, showing that it acts as a distributor or equalizer of pressure throughout the whole cranial cavity. Whether it also acts as a sort of water cushion to protect the brain against shocks was more than doubtful. The same conditions which led to the uniform transmission of the normal increase of arterial tension explained the effects of sudden or gradually increased pressure on the brain, such as that caused by a severe blow on the skull, by the rapid injection of a non-absorbable substance, by bullets of high velocity traversing the brain, and by the growth of intracranial tumours. In the last case pressure propagated into the intravaginal sheath of the optic nerve was the cause of papilloedema or so-called optic neuritis. Another indirect result of increased tension of the cerebro-spinal fluid was the degeneration of the posterior columns of the spinal cord, which occurred in cerebral tumour. In the diagnosis of parasyphilitic affections great reliance had been placed on what was termed in Germany the four reactions: (1) The Wassermann reaction in the blood; (2) an excess of globulin in the cerebro-spinal fluid; (3) lymphocytosis of the fluid; and (4) Wassermann reaction of the fluid. He said it would appear from the most recent work that all four reactions might be found in tabes, general paralysis, and cerebro-spinal syphilis, and that one could not, as had hitherto been supposed, accurately differentiate syphilitic from parasyphilitic nervous affections by this method. The great test was the therapeutic one, for in parasyphilitic affections mercurial or salvarsan treatment did not influence the Wassermann reaction. The recent discovery of the *Spirochaeta pallida* in the substance of the brain and cord in undoubted cases of general paralysis and tabes seemed to have obliterated the last distinction

between syphilis and parasyphilis. The probable explanation of the failure of antisyphilitic treatment to arrest the disease was that remedies conveyed by the blood stream failed to reach the spirochaetes embedded in the nerve tissue. Hence it appeared rational to introduce into the cerebro-spinal fluid, if it could be done with safety, some of the agents which are known to be fatal with the spirochaetes. Salvarsan could not be so injected, but Swift and Ellis had introduced the serum of one who had first received an intravenous injection of salvarsan, diluted with normal saline, into the spinal subarachnoid space at intervals of from two to three weeks. In some cases the results had been very satisfactory. Dr. E. Farquhar Buzzard, in a paper on *Facial spasm*, said that pathologically they might be divided into three main classes: (1) Psychogenic, (2) cortical, and (3) peripheral. Other cases occurred which did not fall into these groups. In the psychogenic class he included the tics and hysterical spasms, and also movements persisting after chorea. Under peripheral spasm he included all cases in which the seventh cranial nerve or its nucleus was the site of a lesion, and closely associated with this group was the pure reflex spasm best seen in trigeminal neuralgia. For the condition which had been variously called "true facial spasm" and "tic convulsif," but for which he preferred the name "chronic fascio-spasm," alcoholic injections into the nerve were useful. Although the only treatment calculated to relieve the disorder, except division by the knife, it was not to be urged upon any patient.

ROYAL SOCIETY OF MEDICINE.

Surgical Section.

At a meeting on October 14th, Mr. Makins, President, in the chair, Mr. C. A. Pannett read a paper on selection of the *Incision in coeliotomy*. The ideal should be to restore the abdominal wall to its original condition. As a rule this was not attained owing to damage to the nerves or stretching of the muscles and aponeuroses. He had found that after abdominal operations certain portions of the abdominal wall were paralysed; the portions of muscle paralysed in incisions for the gall bladder, testicle, appendix, and kidney, for instance, was represented by the vertical slip to the inner side of the incision. The nerves should be avoided by making incisions parallel to them. It was impossible for them to be displaced, as they passed through the posterior wall of the rectus. Correct diagnosis was essential, as then the organ was rendered easily accessible through quite a small incision made over it. He preferred a paramedian incision to an incision through the umbilicus; Mayo Robson's gall-bladder incision caused considerable injury. For appendicectomy he preferred a right rectus incision. Mr. Dauber thought that Mr. Pannett had been unfortunate in his cases. The speaker had seen only a very small percentage of hernias after a median umbilical incision. He preferred a transverse incision half an inch below the margin of the pubic hair for pelvic operations. Mistakes were often made by using too small an incision. Mr. Frank Kidd, in a paper on *Pyeloradiography*, said that it was important for the diagnosis of the size and shape of the ureter and renal pelvis. He used a 5 per cent. solution of collargol in thin people, and a 7 per cent. in fat; from 4 to 10 c.cm. were passed up the ureter by gravity. This required a pressure of 30 mm. Hg. No anaesthetic was given, and only one skiagram should be taken, with a quick exposure of 15 sec. Renal colic had been recorded in cases in which the collargol had been left too long, or had been used too strong. The medulla was always infiltrated, but not the cortex, unless the collargol had been used too long or under too high a pressure. The whole process must take less than a minute if the cortex was to escape infiltration. Some sections cut by Dr. Turnbull showed that it spread up the collecting tubules, but later might get into the lymphatics. The solution usually produced no harm, but occasionally was followed by slight temporary changes. Malformations of the kidney could be easily diagnosed, and these abnormalities were much commoner than was to be expected. There now need no longer be the fear of removing a solitary kidney. Early dilatation of the pelvis, the differential diagnosis of renal from other tumours, the exact position of a stone, and the condition of the kidney before operation, the differential diagnosis of pyelitis, pyonephrosis, and perinephric abscess were amongst the conditions that now could be diagnosed with certainty. Discussion on the paper was postponed.

Section of Obstetrics and Gynaecology.

At a meeting on October 9th, Dr. W. S. A. Griffith (President) in the chair, Miss Ivens (Liverpool) read a paper on *Adnexal tuberculosis*, based on 23 cases which had come under her observation. In all but one the disease was apparently primary. A history of obscure peritonitis in girlhood, followed by primary amenorrhoea, was given in 4 cases, and partial or complete amenorrhoea was very common. Pelvic pain, bearing no special relationship to menstruation, was generally present, and was associated with leucorrhoea. The majority of the patients were in the early twenties, and 14 were married, but only 2 of the patients had borne children, each of them having had one child only many years previously. In only 2 of the cases was the disease unilateral, and in every case a varying degree of thickness of the tubes could be felt. Laparotomy was performed in 22 of the cases, the ovaries being conserved in all but 6. Drainage was avoided, except in the presence of a secondary infection, and primary union usually followed. Two of the patients died after operation; 1 unilateral case required a second operation for the removal of the remaining tube; 3 made a good recovery from operation, but were then lost sight of; and 16 were traced and found to be doing well. The speaker advocated operative treatment of adnexal tuberculosis in all cases in which a second active focus did not exist, and considered that the operation not only had a beneficial effect on the patient's general health, but at the same time obviated the risks of dissemination or local complications. In reply to questions, she stated that her cases included both active and chronic types, and that tuberculous endometritis had been found once. Systematic curettage had not been practised, since leucorrhoea tended to disappear after the removal of the diseased tubes.

Section of Otology.

At a meeting on October 17th, Mr. Richard Lake in the chair, the following were among the exhibits:—Mr. W. M. Mollison: A man, aged 43, who three months previously, while at sea, had received a severe blow on the left side of the head. On recovery he showed loss of sight in the left eye and deafness on the left side. On admission to hospital the third, fourth, fifth, sixth, and seventh cranial nerves on the left side appeared to have lost their function. The upper tone limit of the sound ear was 20,000 vibrations, that of the left 12,000. *Rotation tests* (ten turns) showed fifty seconds nystagmus on the right side, ten seconds on the left. Three weeks previously an operation was performed on the left ear to restore the meatus, and definitely improved hearing ensued, the upper tone limit now being increased to 18,000. Syringing with cold water on the right gave good reaction in about forty seconds and in the left in fifteen seconds. The damaged eye showed the rotatory movements very effectively. It would be necessary to remove the damaged eye. Mr. Sydney Scott: A case of sero-purulent *Lepto-meningitis*, which made a rapid recovery after a translabyrinthine operation. The diagnosis was made on the presence of 3,500 polymorphonuclear leucocytes per centimetre in the cerebro-spinal fluid, which was withdrawn by lumbar puncture. The meningitis arose in connexion with labyrinth disease, secondary to chronic suppurative otitis media. Mr. O'Malley raised the question of what phenomena should be held to justify vestibulotomy, and what were the risks attending that procedure. He himself was guided by the teaching of Bárány and Neumann. The former did not open the labyrinth in cases of circumscribed labyrinthitis with moderate hearing, unless vertigo and vomiting were severe. Neumann, if the hearing were good, even when tests showed no response from the vestibular apparatus, regarded such cases as inflammatory, and preferred to watch them. In the case shown the hearing was relatively good, and the patient was not very ill. The

great risk of vestibulotomy was meningitis, and the question of skin-grafting in such a case merited careful consideration. In such a case he would not have grafted, as the more efficient the skin-graft the more completely would it lock up any sepsis. Mr. C. E. WEST said he had discontinued skin-grafting in cases where he could not find a fistula at the time of the operation, owing to two unfortunate experiences. Dr. DAN MCKENZIE agreed with Mr. O'Malley's remarks, and said that unless the labyrinth were obviously destroyed as a whole, he contented himself with the radical mastoid operation. Many cases had been shown in which fistulae had healed and the labyrinthine irritation had passed off after the simple radical mastoid operation. Mr. SCOTT replied that he did not show the case because of the skin-grafting, but to illustrate the method of early diagnosis. Mr. HUNTER TOD showed a case of *Trichophyton granuloma* affecting the auricle and other parts of the body. The application of *x* rays caused disappearance of the growth in six months.

SECTION OF PATHOLOGY.

AT a meeting on October 21st, Dr. F. W. ANDREWES, in a presidential address on the nature and degree of *Specific differences amongst bacteria*, pointed out that in the early days every observer baptised new species with an air of certainty. Then followed a period of study of the biological properties and their etiological association with disease, leading to a greater apparent certainty in discriminating between allied forms. More recently it had been found that even biological properties were readily variable; both their disease producing and fermenting properties, and still more recently agglutination methods, had brought about a minute differentiation between otherwise similar forms of bacteria. He was compelled to admit that in spite of constantly increasing refinements in methods of study, and partly in consequence of such refinements, the term "species" was an extremely elusive one to define. The criteria on which naturalists based a definition of species could not be applied by the bacteriologist, as sexual reproduction and extra conjugation were unknown amongst bacteria. The high degree of variability—this being specially marked in regard to physiological properties such as pathogenic power—was explicable by the absence of sexual reproduction; the inordinate rapidity of multiplication allowed the effects of environment to become apparent in a very short space of time. The mechanism by which animal passage revived the power of virulence was one of natural selection, and an excellent example of the principle of "survival of the fittest" in a community in which extreme rapidity of reproduction gave natural selection an opportunity elsewhere unparalleled. Bacteriological science was now wholly freed from the doctrine of immutability of species, though the term conveniently expressed the notions of workers as to the relations of a fixed group of individuals. Pathogenicity or metabolic capacity had to be taken with caution as evidence of specific value, whilst morphological distinctions, being slight or absent between closely related bacteria, were almost valueless in differentiating species, though of fundamental value in defining the larger systematic groups. Such characteristics as pathogenicity, fermentation, or serological tests were not employed as generic criteria, and, indeed, these were of later origin than generic distinction. But although bacteria were so variable, the variations did not transgress the generic groups—for example, cocci could never change to sarcinae. Furthermore, small genera containing one or two forms, such as anthrax or glanders bacilli, showed more constancy than large genera—for example, the *coli*-typhoid group. The speaker proceeded to discuss the existence and permanence of specific distinctions within the limits of a genus. Regarding such large genera as the *coli*-typhoid group and the streptococci, which were excessively abundant in nature, rich in number of forms, and presented the highest degree of variability, the greatest disputes had arisen. The multiplicity of forms in the "dominant genera" he held to be due to the readiness with which physiological characters were gained or lost under direct influence of environment, such modification being handed on by direct binary fission without the check imposed by sexual propagation. The statistical method alone was of use in the study of closely related forms, so that when any arbitrary group of characteristics were taken as a standard, certain predominant groups stood out as giving the same set of characters, and these were connected by smaller intermediary groups. He instanced the streptococci as a typical example of a "dominant genus," though he looked upon this genus as a melting-pot from which variable species were still emerging, whilst the typhoid group had advanced much further, so that not only had fairly definite species emerged, but the genus itself had become broken up into rather ill-defined subgenera—for example, dysentery, typhoid, Friedländer, etc. He proceeded to discuss chemical evolution, and the possibility of explaining differences between genera and specific tests on the basis of minute differences between the configuration of the molecules of protoplasm. But he held that this did not give any guide to the classification of species, and he confessed ignorance of what criteria would help to distinguish between species of bacteria, for no standard existed by which it was possible to determine specific limits, such as were applicable to more highly organized creatures. The speaker concluded with the suggestion that the labile nature of bacteria rendered them a promising field of study for the evolutionist, in which he might experiment at will with species in the making, instead of drawing his inferences from types already fixed.

DERMATOLOGICAL SECTION.

AT a meeting on October 16th, Dr. J. J. PRINGLE, President, in the chair, the following were among the exhibits:—Dr. S. E. DORE: A case of *Granuloma annulare* of the hands in a man for many years resident in Ceylon, who also presented the condition known as "tropical skin." Two members stated they had observed good results from the treatment of the former condition by *x* rays. Dr. GRAHAM LITTLE: (1) A case of Raynaud's disease in a middle-aged woman with marked nail changes of the hands and feet. It was suggested by members that the latter was possibly due to a ringworm invasion. (2) A case of unusually acute *Acne varioliformis* of the scalp and face. The PRESIDENT remarked on the rarity and difficulty of diagnosis in such acute cases in the early stages; successful results by vaccine treatment had been reported from America, but his own experience did not confirm that. (3) A case of *Chronic hypertrophy of both lips*, probably secondary to pyorrhoea alveolaris. Dr. J. H. SEQUEIRA: (1) An example of mixed leprosy. Dr. WHITFIELD referred to the use of salvarsan and tuberculin for diagnostic purposes in such cases, and Dr. PERNET related a case in which tuberculin had provoked an eruption of leprous nodules. In reply, Dr. SEQUEIRA stated that in his experience the Wassermann reaction was not constant in leprosy. (2) A typical case of so-called *Multiple idiopathic pigmented sarcoma* in an early stage, in a Russian Jew. The PRESIDENT said that in one of two cases of this disease under his care, spontaneous involution had occurred; pathologically the disease presented affinities with granuloma fungoides. Dr. MACLEOD reported having found lymphomatous nodules in sections from one case. In reply to a question, Dr. SEQUEIRA stated that in 2 out of the 5 cases seen by him there were evidences of gout. Dr. PERNET exhibited (1) a case of diffuse vascular naevus in a boy; (2) a case of permanent alopecia with dystrophy of the nails following *x*-ray treatment for tinea tonsurans. Dr. W. K. SIBLEY: A very extensive *Mixed naevus* implicating the buccal and nasal mucous membranes. Dr. J. M. H. MACLEOD: A case of *Vesicating urticaria* of face, arms, and hands of a girl, aged 12, to elicit opinions as to diagnosis and nomenclature. The PRESIDENT said he had experienced the same difficulty as the exhibitor in classifying these cases, and agreed with Dr. MacLeod that the best method of treatment was by intestinal antisepsis. Dr. HALDIN DAVIS: A case of *Mycosis fungoides* in a woman exhibited some months previously. It had undergone marked improvement in many respects under arsenical treatment, no local remedy except soft paraffin having been used. Dr. J. L. BUNCH: A child with *Keratosis spinulosus* of the scalp. Dr. S. E. DORE (for Dr. Winkelried Williams): A case of *Linear atrophy* of the arms and legs.

UNITED SERVICES MEDICAL SOCIETY.

At a meeting on October 9th Colonel Bruce Skinner, in a presidential address, pointed out that the society afforded an opportunity to all medical men to discuss methods of bringing their technical knowledge to the aid of the sailor and the soldier under war conditions. Many medical men had had no opportunity of seeing war, or even its peaceful presentiment at manœuvres, and to these the discussions held by the society were especially valuable. Those who had had a little experience in these directions heard discussed the difficulties of applying principles to varied situations, and learnt thereby the value of the initiative which enabled a man to adapt himself and his appliances to varying exigencies. A perusal of the past proceedings of the society showed how well the papers read illustrated the varying conditions of war and the different circumstances with which all medical men engaged in war operations might have to deal. They offered solutions of problems which could not fail to have their value when prompt action was demanded, and contained suggestions which might lead to advances in organization. They showed, too, that the discussions were useful to men who had lived in their shells and had not polished their wits by conference and discussion with their fellows. Much of the success of the society was due to officers of the Territorial Force, who made their colleagues familiar with problems with which they themselves had been faced. The speaker hoped that they would continue to widen the knowledge of army medical officers in general, since their papers were of immense value, by showing how closely were connected all spheres of the work of providing for the medical needs of armies. He also hoped that medical men from the Colonies would make use of the society when on visits to Great Britain, and furnish it with matter which would assist in co-ordinating its work, so that it might assume an imperial scope. The speaker then drew attention to various technical problems which at the present time demanded discussion from the point of view of the Army Medical Service, but added that the work of the society was by no means confined to such subjects. The discussion of any question relating to diseases specially affecting the services, and of any problems relating to the health and maintenance of its members, was of much value. Those who had any ideas upon these subjects should not hesitate to bring them forward on the ground that they were only juniors in rank. The society was not official, and the words of thinking men of all ages were worth due consideration. Colonel Wilson, C.M.G., then read a paper dealing with some of the *Problems of mobilization specially affecting the Royal Army Medical Corps*. One of the chief of them was the fact that whereas in other units there existed in peace something which could be used as a nucleus on mobilization, the medical units were formed only on mobilization, and the whole existing peace organization so far as the subordinate personnel was concerned would have practically to be destroyed in order to form the new units required for the uses of war. It was hardly sufficiently realized what an absolutely clean sweep there would be of all effectives from the hospitals when mobilization was ordered. In 1899 the military hospitals had been only gradually stripped of their non-commissioned officers and men, but next time the denudation would be complete and immediate. Another difficulty was the diverse nature of the duties of the active service units; this necessitated complicated training and a great need for specialization. In a general hospital 40 per cent. of the total subordinate personnel required to be specially trained men. The peace establishment serving at home was 3,065 men, and 8,781 non-commissioned officers and men would be required on mobilization. As the balance would have to be made up from reservists who were in most cases privates, there would be an immense and immediate demand for non-commissioned officers. Among the remedies suggested were that all men possible should be trained continuously and incessantly in some special line of work, and that every intelligent and well-conducted man should be encouraged to qualify for employment as a non-commissioned officer. Though a Territorial non-commissioned officer in Category B had to revert to the rank of private on mobilization, the shortage of such officers would lead to their immediate repromotion.

Reviews.

THE CHILDREN OF TUBERCULOUS PARENTS.

Dr. Wilhelm Weinberg's work on the children of the tuberculous[1] is based upon a statistical analysis of some 18,052 children the offspring of those persons whose deaths were attributed to tuberculous disease and occurred in Stuttgart between 1873 and 1902. The sources of the material were the official death certificates, and the amount of labour involved both in the arrangement and analysis of so many particulars must have been great. In the first part of the book the analytical methods employed are explained. On p. 33 an approximate method for deducing the coefficient of correlation is described, but neither the formula there given nor that printed on p. 128 is correct. If the value of k given on p. 33 be expressed in the usual notation and multiplied by 4 we have a well-known approximation, given by Pearson in a memoir cited by Weinberg, and this is apparently the formula he has actually employed to obtain the coefficients tabulated on p. 128. The misprint is an unfortunate one, but the worked example on p. 35 should enable the reader to make the necessary correction, since the factor 4 appears there in its proper place. The author's remarks on the method of contingency are somewhat perfunctory, but for the purpose he had in view it was unnecessary to discuss the subject at length.

In the remaining sections the results of a statistical analysis are described in detail; numerous illustrative tables are provided, and many interesting conclusions emerge. If a comparison be made between the net fertility actually observed in the case of tuberculous persons and that calculated on the basis of the fertility of non-tuberculous parents, attention being paid to age distribution, it appears that the net fertility of the males is subnormal (in the ratio of 1.77 to 1.90), that of the females higher than the calculated value (in the ratio of 1.78 to 1.67). By "net fertility" the author understands the proportional number of children which have survived the twentieth year of life. A study of the influence of order of birth upon rate of tuberculosis mortality points to the later born children dying at a somewhat higher rate. The author considers that this result stands in direct opposition to the view of Pearson that the first and second born offspring are more subject to tuberculosis than other members of the family. As Weinberg is dealing with mortality, while Pearson was concerned with incidence, the two problems are not identical, but we assent to the former's conclusion that the alleged greater liability of the early born children needs confirmation.

The author provides a valuable discussion of the general and specific mortality of the children. They exhibit an enhanced mortality not only from tuberculosis but from all causes, and the important point is made that the degree to which the actual mortality exceeds the calculated varies with the interval between the deaths of parent and child. Thus, if we put the expected mortality of the children as 100, the actual figures are 267 and 333 in the cases of deaths less than five years before or five years after those of the tuberculous parents, but only 121 and 227 for deaths occurring more than five years before or after those of the parents. The obvious inference that this is due to the enhanced opportunities for infection consequent on the illness of a parent cannot, however, completely account for the facts, since a similar although less marked excess is found in the case of deaths from diseases other than tuberculosis. The values are 133 and 156 for deaths within five years, and 114 and 82 for deaths more than five years from that of the parent. The author's discussion of this very important matter deserves careful study.

The limitations imposed by the nature of the material upon the scope of the inquiry render the conclusions based upon it provisional, but this fact in no way derogates from the importance of the work. Some of the author's inferences are not likely to pass unchallenged. Thus, Dr. Weinberg writes (p. 157):

> In considering the tuberculosis problem from the standpoint of race hygiene, it is some consolation that the fertility of the tuberculous is not at all excessive, that, on the contrary, it

[1] *Die Kinder der Tuberkulosen.* Von Dr. med. Wilhelm Weinberg. Leipzig: S. Hirzel. 1913. (Roy. 8vo, pp. 160. Mk. 5.)

seems to lag behind that of the non-tuberculous. But in this connexion a continuance of the inquiry down to the most recent time and its completion by a study of synchronous births are necessary.

We did not know that even the zealots of eugenics had asserted that the fertility of the actively tuberculous was higher than the normal. The suggestion usually made is that the members of fertile stocks are more liable to tuberculosis than the offspring of less fertile stocks, and that the former stocks also exhibit a higher incidence of other pathological states—such as insanity—in which the factor of infection does not come into play. As a matter of fact, Dr. Weinberg's own investigation (pp. 98-9) shows an increase in the rate of mortality with size of family, and, although the explanation may be, as he holds, mainly increased opportunities for infection, this may not be, as he himself hints, the whole truth. This, however, is a subject upon which those best able to judge are by no means agreed, and we have no hesitation in commending Dr. Weinberg's book to the attention of all students of tuberculosis. We should add that, although many of the analytical methods used are highly technical, the account can be followed easily by any intelligent reader, even although he may have no preliminary training in statistics.

UTERINE CONTRACTIONS IN RELATION TO RUPTURE.

DR. WERBOFF'S[2] monograph on the normal work of the uterus and its rupture during labour consists of three parts, the first of which, that on spontaneous rupture, probably initiated the train of thought which led him on to the others in which he revises his mental picture of uterine action, and devises a special bandage for relief or supplement of the contractions of voluntary muscles by which, after a certain stage, the work of the uterine muscle is reinforced. Beginning with the cases of rupture observed in St. Petersburg, which are recited in detail, he shows that they never allowed of recognition as cases of impending rupture, and that when rupture was already present the classical symptoms as described by Bandl developed. Going on from this to a consideration of the 13 cases recited in Bandl's monograph, he shows that in 10 the rupture had certainly occurred before admission. The 3 which were observed did not present the classical symptoms of which the description was in fact given from a case in which no rupture was found on palpation. Allowing for the uncertainty of the inferences from palpation Werboff, in the light of a case described by Knauer where rupture of the outer muscle layer was found, considers that in Bandl's case also rupture was already in progress, and argues that the classical picture is not one of threatened rupture but of rupture already commenced. From this come the pain and tenderness, the bloody amniotic fluid, and the arrest of contraction. The ordinary conception of a contracting upper segment and a dilating lower one does not properly describe the true nature of the uterine action, which is really a typical peristalsis.

In the second section Werboff gives seventy pages to a discussion of the nature of uterine contraction. The view from which he starts is that the elongation of a muscle after contraction is effected through the contraction of its antagonist, and that peristalsis is a seesaw action in which longitudinal fibres shorten and widen an organ, and circular fibres contract and elongate it. In the uterus he considers the first stage to be one in which longitudinal fibres are mainly active; in the second stage circular fibres contract, reinforced by the voluntary muscles. He states that in observation the uterus is found to shorten and broaden in the first stage, and to narrow and lengthen in the second. He describes it as taking support for its pressure from the diaphragm and the abdominal wall. Shortening and subsequent lengthening are matters which should be capable of being tested by systematic observation, and this work obviously awaits some one who has the needful opportunities of watching cases from the onset to the end of labour.

The practical conclusion of the author's argument finds expression in the third section, where he discusses the question whether we can ease and accelerate labour, and answers in the affirmative by describing a special bandage by which the straining of the voluntary muscles can be replaced. He reports that the bandage has been employed with good results in 123 cases in the St. Petersburg Institute. The work is specially interesting as a stimulus to a detailed reconsideration of the ideas of uterine contraction, and it merits attention, whether its conclusions are subsequently confirmed or not.

[2] *Die Gebärmutter des Weibes ihre normale Arbeit und ihre Zerreissung während der Geburt.* Von Dr. Werboff, Assistenzarzt am Kaiserl. klin. Institut f. Geburtshülfe u. Gyn. in St. Petersburg. Berlin: S. Karger. 1913. (Sup. roy. 8vo, pp. 150; 66 figures, 10 plates. Mk. 6; bound, Mk. 7.60).

CANCER OF THE BREAST.

A VOLUME which records the experience of an eminently practical surgeon on a subject of everyday interest is sure to arrest attention, and Mr. C. B. LOCKWOOD'S experience of the operative treatment of *Cancer of the Breast*[3] is certain to be worth considering. The key to the book which he has published under this title lies in the recognition of two important factors—immediate microscopic examination of the tissue removed within the operating theatre or its precincts, and the "complete" operation. The microscopic examination is made at the beginning of the operation, as soon as anaesthesia is established. The extent of the operation naturally depends on the result. The examination has in time come to be so speedily made that a section is ready in five minutes for the operator to examine for himself. This method has obviously many advantages, for operators would, by immediate microscopic examination, gladly save themselves the chagrin and patients the mutilation of a complete operation performed for a non-malignant growth. From the stringency with which the microscopic diagnosis is insisted upon, it may be inferred that the clinical diagnosis is not always reliable. Cancer of the breast, in spite of its external position, is essentially almost as insecure of diagnosis as cancer in other situations.

The complete operation is that performed in every case of cancer diagnosed clinically with microscopical confirmation. It consists in the removal of the nipple and areola, with an area of skin over the tumour, the whole of the mammary gland, both pectoral muscles together with their fasciae, the costo-coracoid membrane, and the fasciae over the anterior part of the serratus anterior (magnus), the superior part of the external oblique, the subscapular, the teres major, and part of the latissimus dorsi. All the axillary fat and the lymph vessels and lymph glands therein come away together, and in one piece with the rest. This formidable operation is employed for any kind of cancer, no matter how small and apparently limited. The author believes that if recurrence takes place it is because the whole of the cancerous growth has not been removed, and therefore it is not a true recurrence at all. The only true recurrence he recognizes is reappearance in the other mammary gland, though he is willing enough to use the word in its everyday sense. He has performed the complete operation 134 times, and 31 times has he found recurrence. Of course, many of these cases were very greatly advanced, one or two practically hopeless. Wherever the disease is limited to the mammary gland the complete operation is successful; all the patients in this group are still alive, some having been operated on eleven years ago. But if the disease has spread beyond the mammary gland, the result of the complete operation, "measured by duration of life, depends upon circumstances which are not within the control of the surgeon; for we have no means of knowing the direction, the distance, or the manner in which the growth may have spread." The author does not accept the dictum that if no recurrence takes place within three years the case is cured. He holds that there is no time limit.

The results of the incomplete operation were so unsatisfactory that the author long ago gave it up. He has records of 29 cases, and in 11 of these recurrence took place, and the duration of life in some of the others was not long enough for recurrence to become manifest.

The only other matter of interest to which we wish to allude is the short circuit of the lymph vessels in cancer of the breast. This short route is through the fibres of the pectoralis major, reaching the glands about the upper end

[3] *Cancer of the Breast: an Experience of a Series of Operations and their Results.* By C. B. Lockwood, F.R.C.S.Eng., Consulting Surgeon to St. Bartholomew's Hospital, etc. London: Henry Frowde, and Hodder and Stoughton. 1913. (Demy 8vo, pp. 244; 23 figures. 10s. 6d. net.)

of the axillary vein. Indeed, the author thinks that this rather than the axillary channel may be the ordinary route of lymphatic spread. The importance of this fact is obvious, and if it be established the absolute necessity for the complete operation will be the more evident.

The book might have been materially improved had greater attention been given to the arrangement of the matter, for it is irritating to find the narrative frequently interrupted by rather brief references to cases. The book is, indeed, not a formal treatise on cancer of the breast; it contains no references to recent investigations into the mode of spread of cancer, and there are no illustrations; but as what it professes to be—a record of one man's clinical experience—it is a valuable contribution to medical literature, and as such can be commended to the consideration of the profession.

THE NERVE IMPULSE.

The theory of *Nerve Aggregation*, set forth by Dr. Elliot-Blake in the volume published under that title,[4] is in some respects a departure from the accepted view as to the physiology of innervation. In the first place, he dissents from the opinion that the nerve impulse is of electric origin and nature, pointing out the feebleness of the electrical changes revealed by the galvanometer as an accompaniment of nerve action, and their universal association with chemical or tissue reactions. He does not, of course, deny that nerves will react to electrical as well as other stimuli, or may conduct electrical currents; but, under normal as distinguished from laboratory conditions, the electrical phenomena are, in his opinion, by-effects rather than essentials of innervation. As to the precise nature of the impulse, he does not seem to have quite made up his mind, but suggests that it may be either of a contractile or mechanically vibratile kind—a flow-discharge over the cellular processes, axons, and dendrites of the nerve elements.

With regard to the mechanism of reflex action, Dr. Elliot-Blake conceives it, not as the result of a single afferent impulse, directly reflected from the recipient ganglion cell along some efferent path, but as the culmination of a previous preparatory process. This preparation consists, he believes, in a gradual and cumulative sensitization by the ganglion cells of spinal or cerebral nerve centres by nerve impulses of different kinds and sources. The "force of irritation" thus gathered or aggregated from any number of sources is compared to the filling of a tank. The final explosion or overflow is only possible when the tank is full—that is, when the force of irritation has attained to or nearly to its maximum. And for every important centre of reflex action there exists, Dr. Elliot-Blake believes, a definite collecting area of exploding or "climax" impulses, by which the accumulated force of the central cell is released. According to the average duration of the period of "aggregation" in the centres concerned, the author classifies nerve cycles as "immediate," "middle," or "long," respiration being a type of the first, defaecation of the second, and menstruation or childbirth of the third. Typical exploding stimuli would be those produced by the pressure of faeces upon the perineum, or the stretching of the cervix uteri by the oncoming head. The strong points of this theory are well brought out in some clinical applications, particularly in the section dealing at length with lumbago. Dr. Elliot-Blake does not accept the current view that this disorder is usually a fibrositis of the lumbar tissues. "In lumbago," he says, "wide and added nerve irritations keep on arriving at the lumbar section of the cord, and eventually these result in lumbar pain." The location of the pain, which of course is below the lumbar segment of the cord, he attributes to the brain. He points out the frequency at what he calls the "lumbago age" of such conditions as enlarged prostate, thickened bladder, constipation, renal calculus, uterine congestions, etc., any one or combination of which he regards as a possible source of bombardment of the cord centres with morbid impulses of cumulative effect. The muscular rigidity he regards as protective, not inflammatory, in origin. The second part of the book comprises some practical novelties. We may mention among these a form of head bandage and an improved method of tying a skein truss for hernia. Then follows a dissertation entitled, "Bio-mouldings," which appears to embody the author's reflexions upon the *rationale* of evolution. We must frankly say that in our opinion Dr. Elliot-Blake has here failed to give intelligible expression to his ideas. On the more familiar and concrete ground of professional topics he usually manages to convey his meaning to the attentive reader; but here, and in some similar flights of speculation, his views are for the most part shrouded in a fog of involved sentences. Still, we are unwilling to end upon a carping note, for the book, taken as a whole, is original and stimulating.

[4] *Nerve Aggregation and Medical Free Paths.* By H. Elliot-Blake, M.R.C.S., L.R.C.P. Free Path Series, vol. iii. London: John Bale Sons, and Danielsson, Ltd. (Fcap. 4to, pp. 275. 11s. net.)

STATE INSURANCE AND MEDICAL PRACTICE IN GERMANY.

Professor Quincke has written an essay on changes in the science and practice of medicine,[5] which deals with science only in so far as its rapid development has led to the present extensive specialization from which he sees no prospect of return. In practice he has to discuss the results of the insurance system, and his conclusions contain both encouragement and warning for the medical politician. Whatever improvements have been effected have been secured by professional union. On the important issue of free choice of doctor he says: "The desire expressed some years ago for completely free choice of doctor could not be fulfilled for various reasons, partly financial and partly from the nature of the case. For their very existence the insurance offices must exercise a certain control over their beneficiaries as well as over the doctors. The doctors were the first to recognize this and take it to heart. Thus arose in practice the system of organized free choice of doctor, under which in so far as he will observe certain conditions every doctor practising in the area may attend the insured." The economic conditions of the profession are even now much below those under which the insurance service has started here. In the matter of hospitals the author emphasizes the enormous development of hospitalization which has taken place and the great increase in the financial burden which has been transferred to the public authorities, and he concludes by discussing the evil of mingling charity and business. The principle of his conclusion has fortunately been the basis on which the British Medical Association has founded its campaign for hospital reform.

NOTES ON BOOKS.

The Hygienic Management of Labour in the Tropics[6] is the title of an essay by Dr. P. N. Gerrard, of the Federated Malay States, in which he deals with the preservation of the health of workmen in the tropics. The author states in his preface that he has endeavoured to keep on lines which are practical, to avoid controversial matters, and to present to the planting community a *vade mecum* which will not fail them as a work of reference. He has succeeded in his aim, and the book should prove of great use to all who have to do with estates and the opening up of ground for estates in the tropics. There is no doubt that a little common sense as regards the prevention of some of the more common tropical ailments can make an enormous difference to the health of the coolies. This means for the labourers themselves a great increase in individual comfort, and for the planter a great economy of expenditure. Dr. Gerrard's hints and advice can be thoroughly recommended.

The *Bulletin of the Naval Medical Association of Japan*, published by the Naval Department in Tokyo, contains papers by members of that department. They are printed in Japanese characters, but abstracts in English are prefixed; it would be an advantage if the legends on the plates also were accompanied by English translations. One of the papers in the fifth number of the *Bulletin* contains an account by Fleet Surgeon H. Yamamoto of a case in which he sutured the brachial artery

[5] *Wandlungen der Medizin in Wissenschaft und Praxis.* Von Prof. Dr. H. Quincke. Berlin: Julius Springer. 1913. (Demy 8vo, pp. 46. Mk. 1.)

[6] *On the Hygienic Management of Labour in the Tropics.* An essay (with which is incorporated the Labour Code, by courtesy of the I.M.S. Government). By P. N. Gerrard, B.A., B.Ch., B.A.O., M.D.Dub. Singapore: The Methodist Publishing House. 1913. Roy. 8vo, — 92 5a

by the method of Carrel and Stich. The injury, which was a contused wound, had occurred forty-eight hours before operation. Immediately after the operation pulsation was noticed beyond the sutured part of the vessel, and after thirty minutes the radial pulse was felt. The wound healed by first intention. The discoloration of the nails, coldness of the fingers, and feeling of weakness in the arm present before operation gradually disappeared. The radial pulse gained in strength, although it did not become so strong as that of the opposite side. No hindrance to the movements of the limb resulted, and the patient was able to leave the hospital sixty-seven days after admission.

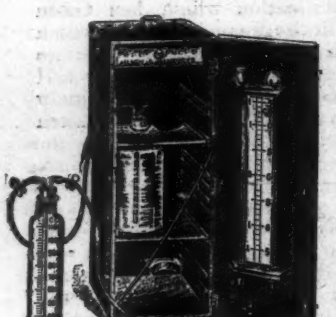
The book bearing the title *About Baby*[1] is of American origin, its author being Dr. FRANCIS TWEDDELL, of New York. It enjoys the distinction of two introductory notes, the one by an English matron, the other by Dr. W. Barkley, of Southfields, S.W., whose name also appears on the title page in virtue of the fact that he overhauled the book for English consumption, and omitted parts which he considered unnecessary in view of the conditions prevailing in Great Britain. The book, the teaching of which seems quite sound, is clearly written and sufficiently comprehensive to include paragraphs on toys, and perhaps makes none the worse reading for the occasional presence of quaint but grammatically quite correct phrases, such as a "well baby."

The *Tropical Diseases Bulletin*, dated August 30th, 1913, contains reviews on plague, leprosy, beri-beri, tropical diseases of the skin, verruga peruviana, rat-bite disease, vomiting, sickness, and some other miscellaneous subjects.

MEDICAL AND SURGICAL APPLIANCES.

Apparatus for the Production of Artificial Pneumothorax.

DR. S. VERE PEARSON (The Sanatorium, Mundesley, Norfolk) writes: The apparatus here illustrated had its origin in the rough but efficient model put together by a carpenter, the essentials of which were formed by two bottles, some rubber tubing and two glass tubes, contained in a wooden box. The gradual evolution of various simple modifications are the result of practical experience gained by myself and my friends—C. Lillingston, L. Colebrook, and the colleagues who have worked with me at Mundesley. Between us we have given many hundred injections of nitrogen. The advantages of the apparatus, which is now made and stocked by Messrs. Allen and Hanburys, Limited, 48, Wigmore Street, London, are as follows:



1. Its simplicity eradicates, as far as possible, unnecessary complications which may only create difficulties in working.
2. An even, easy, and perfect control of the gas is assured, because the bottles are movable and siphonage is used as the means of regulating the flow of nitrogen gas into the chest.
3. The arrangement of a movable shelf in a tall box makes it easily possible to obtain well-graduated positive pressures up to any amount found safe in practice.
4. The apparatus travels easily.
5. The height of the apparatus gives room for a tall water manometer, the advantages of which are that the occasional high pressures needed are easily read, and, secondly, that there is less risk of the fluid in the manometer through any accident flowing into the tubes.
6. The tall, narrow cylinder makes it easy to read the administration of comparatively small quantities of gas, which is advantageous for a first injection.
7. The bottles contain a sufficient quantity of gas to meet the requirements of an injection for any ordinary case.
8. The thistle funnel on the positive stem of the manometer obviates the risk of the fluid in the manometer being squirted out of it if the patient should cough.
9. The bulb on the negative stem of the manometer prevents the fluid in the manometer from being sucked into the tube if through any chance a high negative pressure should occur.
10. The marks both on the cylinder and on the part with the manometer on it are distinct, and can thus be read at a glance.
11. The screw clamp, put in at the suggestion of my friend Professor Saugman, at the base of the manometer enables the mean intrapleural pressure to be taken during an injection of gas.

[1] *About Baby*. By Francis Tweddell, M.D., and W. Barkley, M.B., B.Ch. London: Mills and Boon. (Crown 8vo, pp. 148. 1s. net.)

AUSTRALASIAN MEDICAL CONGRESS, AUCKLAND, 1914.

THE tenth Australasian Medical Congress will be held in Auckland, New Zealand, next February. The preliminary arrangements were made at the final meeting of the ninth congress held in Sydney in 1911, when Dr. A. Challinor Purchas, of Auckland, was elected President for 1914. A conference then took place between him, the President of the Congress in Sydney (Dr. F. A. Pockley), and the President of the New Zealand Branch of the British Medical Association, and in the following March the members of the Auckland Division of the British Medical Association formed themselves into a general committee for the purpose of making arrangements for the congress. An Executive Committee was appointed, and to it were subsequently added the Dean of the Faculty of Medicine of the Otago University, the medical heads of the various Government departments, the Director of Medical Services of the New Zealand Forces, and the medical members of both houses of the New Zealand Parliament.

The business of the congress will be conducted in eleven sections, as follows:

1. *Medicine.*—President, Dr. Sinclair Gillies, Sydney; Secretaries, Drs. W. C. W. McDowell and E. Roberton.
2. *Surgery.*—President, Dr. Hamilton Russell, Melbourne; Secretaries, Drs. Casement Aicken and Gore Gillon.
3. *Obstetrics and Gynaecology.*—President, Sir David Hardie, Brisbane; Secretary, Dr. Tracey Inglis.
4. *Pathology and Bacteriology.*—President, Professor D. A. Welsh, Sydney; Secretary, Dr. Milsom.
5. *Public Health and State Medicine.*—President, Dr. J. R. S. Elkington, Brisbane; Secretary, Dr. Monk. Subsection, Medical School Inspection and Hygiene.
6. *Ophthalmology.*—President, Dr. F. Antill Pockley, Sydney; Secretary, Dr. J. C. Pabst.
7. *Psychological Medicine and Neurology.*—President, Dr. Chisholm Ross, Sydney; Secretary, Dr. A. N. McKelvie.
8. *Diseases of Children and Orthopaedics.*—President, Dr. H. Swift, Adelaide; Secretary, Dr. G. Brunton Sweet.
9. *Naval and Military Medicine and Surgery.*—President, Colonel Chas. Ryan, Melbourne; Secretaries, Drs. W. H. Parkes and R. Walton.
10. *Dermatology and Radiology.*—President, Dr. Herschel Harris, Sydney; Secretary, Dr. Alfred Clark.
11. *Rhino-Laryngology and Otology.*—President, Dr. H. Russell Nolan, Sydney; Secretary, Dr. W. A. Fairclough.

The honorary secretary of the congress is Dr. Bernard J. Dudley, of Epsom, Auckland, and he has the assistance of Mr. Cyril H. Tewsley, of Kingsland, Auckland. As will be seen, the officers of the sections of the congress are drawn from all parts of Australasia, and this choice foreshadows the attendance of members from an equally wide area.

At the annual meeting of the British Medical Association in Liverpool last year, Dr. Barrett, of Melbourne, gave a cordial invitation to the members present to attend the Auckland congress, and later on a formal letter was received from Dr. Bernard Dudley, written on behalf of the Executive Committee of the congress, confirming the invitation. There can, we think, be no doubt that it would be to the advantage of the Association as a whole that as many members as possible in this country should accept the invitation so cordially given; their presence would help to draw closer the bonds of union between the home branches and those in the over-seas dominions. As will be seen from the list of sections given above, the congress will afford an occasion of learning much with regard to clinical and scientific medicine, and visitors will also have opportunities of becoming acquainted with the organization of the profession in Australasia. Moreover, they will find that arrangements have been made to enable them to see a good deal of New Zealand after the congress. There will be a cruise around the gulf and the islands, visits to the Titirangi Ranges, and a tour through the districts where the famous thermal waters exist.

THE NATIONAL GAS CONGRESS.

CONFERENCE ON ILLUMINATING AND HEATING HYGIENE.

A CONFERENCE on the hygiene of lighting and heating was held on October 14th in connexion with the National Gas Congress. Sir Rickman J. Godlee was in the chair. The time was almost wholly occupied with two papers, one, by Mr. S. Rideal, D.Sc., on the hygiene of gas considered as an illuminant, and the other, by Dr. Leonard Hill, on the health value of radiant heat.

Dr. Rideal's paper was largely a record of certain comparative investigations which he undertook some years ago, and had already published, into the relative hygienic values of gas and electricity. It was somewhat difficult to obtain a distinctive pronouncement in favour of one illuminant or the other on the physiological data brought forward; the use of gas certainly caused a slight increase in the ventilation of a room, and the records of the ophthalmic experiments also were clearly in favour of gas lighting. One novel and interesting experiment was carried out by Dr. Rideal in order to determine the physiological effect of a large coal-gas leakage. Three subjects were enclosed in a room of 2,500 cubic feet capacity for over four hours, and into this room 8.8 cubic feet of gas per hour was allowed to escape. From the carbon monoxide and ventilation determinations this was taken to correspond to a permanent gas leakage of 0.9 cubic feet per hour. No serious symptoms manifested themselves, and in one of the subjects a feeling of pulsation in the temples was the only inconvenience experienced. All of them after a time lost their ability to smell gas. The physiological observations showed a slight increase in the pulse-rate, and in two of the three cases a considerable rise in the respiratory frequency. Dr. Rideal drew the inference that with any quantity of gas likely to escape from an ordinary leakage there was no immediate danger to life.

Dr. Leonard Hill repeated his now familar gospel of air movement and variability. The ideal heating, he said, would correspond with that which prevailed out of doors on a spring day when a cool breeze tempered the radiant heat from the sun. Uniformity and monotony of cutaneous sensations were undesirable. Heating engineers who aimed at supplying a monotonous blanket of air heated to a uniform summer temperature were contravening the natural laws of health. Dr. Hill refused to pronounce the least blessing on the old-fashioned gas fires or the gas convectors (commonly and wrongly called radiators). He would only admit to his favour the modern gas fire fitted with an efficient flue, and giving approximately 50 per cent. of its fuel value in the form of radiant heat. He gave an interesting demonstration with the katathermometer, an instrument of his own invention, for determining the rate of heat loss, which, he said, was a more important determination than the average temperature when ascertaining the healthfulness or otherwise of the air of a room. With this instrument he had studied the conditions in a small room heated alternately with an anthracite stove and with a gas fire. The former gave off 10 per cent. of the total energy as radiant heat, 50 per cent. as convective heat, and 40 per cent. as flue heat. These figures in the case of the gas fire were 41.7, 29.7, and 28.6 per cent. respectively, though in later models the percentage of radiant heat was higher. The results showed that with the gas fire there was less uniformity of heat loss in different parts of the room, and that the radiant heat was unequally distributed over the surface of the body, the feet and legs being warmed while the head remained cool, this last condition being reversed under the influence of convective heat. The objection which Dr. Hill urged against the gas fire was on the ground of the sameness of its flame; it was always burning at an equally steady level. He was trying the attachment of a clockwork arrangement to a gas fire in his laboratory, with the view of introducing a continual variety in the blaze. This spasmodic gas fire, as one engineer called it, rather took away the breath of the gas experts, who have been concentrating for years upon getting the very uniformity of flame which Dr. Hill condemns.

After an adjournment, Professor Vivian B. Lewes supported Dr. Hill's conclusions from the chemical standpoint, and, in dealing with the difference between the methods of radiant and convective heat, said that with the former the human body as well as the other solids in a room was thoroughly warmed by the rays, and if the original temperature was 50° F., a person would feel quite warm and comfortable when the air temperature had risen to 59°. On the other hand, with convective heat, the air temperature would be raised probably to 68° before the same sensation of warmth was experienced. The older forms of gas stove, which gave out only a quarter of the fuel energy as radiant heat and a much larger proportion of convective, brought about an over-rapid evaporation of the air, and this caused the sense of oppression and general discomfort. In the case of the modern gas fire, however, from 45 to 50 per cent. of the thermal value of the gas was given as radiant heat and only from 12 to 20 per cent. ranked as convective, with the result that this trouble had ceased, and the necessity for the bowl of water to supply moisture to the over-heated air no longer existed.

Light and Sight.

The last of the conferences to have a special interest for medical men was held on October 17th, when Lord Rayleigh presided over a gathering convened to discuss certain problems of scientific illumination. Lord Rayleigh himself made the point that in order to suit the requirements of the eye, the distribution of the illumination was fully as important as its amount. He appeared to think that a too diffuse system of lighting might involve visual strain equally with one which was too concentrated. Sir John Cockburn, in proposing a vote of thanks to the reader of one of the papers, made the interesting personal confession that when he wanted to prepare a speech or write an article, and the needful inspiration failed to come, he followed the plan of turning up to the full every light which was available. Doubtless it was bad for the eyes, but he found it act invariably as a mental stimulus.

The principal paper of the conference was read by Dr. Meredith Young, who entered into the light and sight question with great particularity. While he would not support Sir John Cockburn's idea of wholesale illumination in order to whip up the mental faculties, he favoured an illumination of the walls in addition to the more intense local lighting of the desk for mental workers. He also described some tests of the effect of bright light on acuity of vision, which had been carried out by Dr. Cameron Gibson on his suggestion. These seemed to show that a bright light in the field of vision produced a lowering of visual acuity which lasted for some time, provided the line from the light to the eye made an angle of less than 40 degrees with the axis of vision. A fact frequently overlooked was that in the old days of rushlights and candles near-work was practically impossible except during the hours of daylight. As illuminants increased in power and brilliancy it was found that more time could be given to near-work. Therefore, it was only natural to expect that affections of the eye would increase *pari passu* with the increase of near-work done by them, and even with an artificial light which was the exact physical and physiological counterpart of daylight, eye affections would increase with the more prolonged use of the eyes. Dr. Young had elicited the opinions of certain eye specialists to the general effect (with reservations and modifications in some instances) that (1) the introduction of electric light had not increased the frequency of eye diseases or errors of refraction; (2) a brilliancy of 5 c.p. per square inch of lighting source was that which the eye could most comfortably endure; (3) to work with insufficient light was a greater evil than to work with sufficient or more than sufficient but unshaded light; (4) the use of unshaded lights of a greater intrinsic brilliancy than that mentioned above should be prohibited; and (5) the adequate and properly shaded local illumination was the best form of lighting for near work.

WE read in *Paris Médical* of October 18th an interesting case of transfusion of blood. The patient was M. Alphonse Bertillon, whose name is associated with the anthropometric system. He suffered from severe anaemia, which proved refractory to treatment. His physician recommended him to find a friend who should be willing to give him some of his blood. Such a friend was found in Dr. Georges Bertillon, brother of the patient. Blood taken from the radial artery was introduced into the saphenous vein of the patient. In three-quarters of an hour M. Bertillon was greatly reinvigorated. The two brothers are said now to be in perfect health.

THE CULTURE OF SPIROCHAETES AND OF THE VIRUS OF RABIES AND POLIOMYELITIS.

DR. NOGUCHI'S CULTIVATION METHODS AND THE DEMONSTRATION OF T. PALLIDUM IN THE BRAIN.

THERE was a very large attendance of Fellows at the meeting of the Royal Society of Medicine, under the presidency of Sir FRANCIS CHAMPNEYS, on Monday, October 20th, to hear a lecture and witness a demonstration by Dr. NOGUCHI, of the Rockefeller Institute, New York, on the application of cultural methods to the study of infectious diseases of unknown etiology.

Before dealing with the cultivation of the virus of anterior poliomyelitis, in connexion with which his work had been done in conjunction with Dr. Flexner, Dr. Noguchi explained the methods he followed for the cultivation of various spirochaetes, as those were the first organisms which had been obtained in pure culture by these methods. Of spirochaetes he had cultivated three different groups. The first was pathogenic, and invaded tissues. The second group was also pathogenic, but occurred in the blood. The third group was non-pathogenic, and was to be obtained from the mucous orifices of the body or on the surface of moist lesions in various parts. These groups might be termed respectively tissue spirochaetes, blood spirochaetes, and saprophytic spirochaetes. Of the first group, two species had been cultivated—the spirochaete of syphilis (*Treponema pallidum*) and that of yaws. Of the second group four species (all pathogenic) had been cultivated, including the spirochaete of Obermeyer, the cause of relapsing fever in Europe, and the spirochaete of the fowl. Of the third group—that of saprophytic spirochaetes—six species had been cultivated, including *Treponema macrodentium*, *T. microdentium*, *T. mucosum*, *T. refringens*, and *T. calligyrum*, a new species which stood morphologically between *T. pallidum* and *T. refringens*. None of the spirochaetes of this group were pathogenic.

He then described briefly the method of cultivation. For the pathogenic varieties, whether the tissue or the blood spirochaetes, it was essential to have in the culture medium a piece of fresh sterile animal tissue. Saprophytic varieties could be grown without the addition of fresh tissue. For the tissue-spirochaetes he found it necessary to obtain absolute anaërobiosis, and he described and illustrated by lantern slides the apparatus he had constructed for the purpose. For the cultivation of blood spirochaetes, absolute anaërobiosis was detrimental, for if a small quantity of oxygen were not supplied the species would not grow. For the saprophytic spirochaetes strict anaërobiosis was essential. The culture medium was, as a rule, ascitic fluid solidified with agar.

This was the commencement of his work in the cultivation of such organisms. He had then gone on to apply the method to the study of the cause of poliomyelitis. Even an invisible virus can be kept growing outside the body if it be given favourable cultural conditions; it did not matter at the commencement of the work whether the virus of poliomyelitis was visible or invisible. It sufficed at that stage to know that the virus was capable of being transmitted from generation to generation. The study of its morphology could then follow. A similar principle was applied to the study of rabies. It had long been known that in the ganglion cells of a case of rabies there were present certain bodies known, from their discoverer, as Negri bodies. It was also known that the virus of rabies passes through a Berkefeld filter. But a connexion between the Negri bodies and the disease itself had not been hitherto demonstrated. Most pathologists had believed that the Negri bodies were simply reaction products, or the degenerative products of cells, due to the invasion of an unknown but filterable virus. By the use of the cultivation method briefly described above it had been found that some of the bodies could be grown.

Dr. Noguchi turned aside to describe the finding of *Treponema pallidum* in the brain in cases of general paralysis. Many workers in this country and in Europe generally had arrived at the conclusion that general paralysis was in some way connected with a previous syphilitic infection; some maintained that general paralysis was an active syphilitic condition, while others held that it was a remote consequence of the degenerative processes set up by the disease. To solve the question it was necessary to demonstrate the presence of the *Treponema pallidum* in the brain. While studying pure cultures of *Treponema pallidum*, he had observed peculiar forms, which might represent forms of degeneration or possibly a stage in the life-cycle of the parasite, and with these observations in mind he had examined specimens from the brain of 70 cases of general paralysis. The first 69 cases yielded no conclusive evidence. In a specimen from the seventieth brain he suddenly noticed a spirochaete. He thereupon went back over the other 69, and was rewarded by finding the parasite in 13 more. It was found, therefore, in 14 of the 70 specimens (25 per cent.). As it was ascertained that 2 of these 14 cases showed mixed syphilitic lesions in the brain, they were discarded from the records, and only 12 reported as successful. The material on which this research was based was derived from a single hospital; he therefore determined to examine a larger number of brains from several hospitals. Now 130 cases had been examined by a modification of Levaditi's method, and in 36 the spirochaete was found, making a total of 48 cases in 200 brains examined.

At about the same time he undertook the study of tabes dorsalis. It turned out to be extremely difficult and tedious. He had very carefully passed in review sixteen spinal cords, but in only one could he find the spirochaete, and in very small numbers; they were in the posterior column. Shortly afterwards the spirochaete had been found by another observer in the intervertebral ganglion of a case of tabes. So that two cases were now on record in which the spinal cord revealed the parasite. It had been found in other cases of general paralysis since his own work. Two German observers, working with the Neisser method—examining a small particle of brain substance by means of the dark field—had observed the spirochaete in 19 cases out of 25 examined.

Another practical consequence of the work was to establish a skin test for the diagnosis of syphilis. This was discovered in 1911, and was known as the luetin test, and since its publication many observers had confirmed his findings. It was more easy to apply than the Wassermann test and made it possible to diagnose latent and tertiary syphilis. A preparation of dead spirochaetes was used, and if the patient were syphilitic, a red lesion developed, sometimes proceeding to a pustule. In one case the trial was made repeatedly, and there was a definite lessening of the intensity of the reaction.

Three main types or strains of *Treponema pallidum* could, he said, be recognized—a coarse form, an average one, and a very thin one, the latter being usually found in malignant syphilis.

Dr. Noguchi showed numerous very beautiful slides, by means of some of which he demonstrated longitudinal division of the parasite and in others a chain-like arrangement, coccus-like bodies being joined together by a strand of protoplasm.

Treponema pallidum had been transmitted from the brain of general paralytics to the rabbit, and attempts had been made to produce symptoms and lesions in rabbits similar to those of general paralysis in man. The central nervous system of rabbits and monkeys was refractory to direct inoculation of the *Treponema pallidum*, so that lesions could not be caused in that way, but by treating these animals with dead spirochaetes for five months, giving them intravenously every five days for five months, then resting five months, and then inoculating into the brain, intracerebrally or subdurally, infection could be produced, the animals suffering from convulsions and emaciation, and giving a positive Wassermann reaction.

The method he used for the cultivation of the virus of poliomyelitis was similar to that described for spirochaetes; injection of the culture into rabbits, guinea-pigs, and dogs was always followed by the development of typical rabies.

The lecture was illustrated by a large series of lantern slides, including photographs of culture tubes in which various spirochaetes were developing, and of a large number of microscopical preparations. Among these were many showing cultivated spirochaetes of various species and *T. pallidum* in the brain. He also showed another series which appeared to indicate that Negri bodies were

derived from the breaking up of a relatively gigantic parasite of round or oval form. A large number of preparations of various kinds were also shown under the microscope.

MOTOR CARS FOR MEDICAL MEN.

The Hercules Tyre and Equipment Company, Bridge Street, Northampton, desires us to state that they will be pleased to send on receipt of a stamped envelope a free sample tube of their patent tyre cure stopping to any medical motorist.

Insurance: Accident or Mechanical Breakdown?

In Bolton County Court on October 15th a medical man was awarded judgement with costs on the higher scale in an action brought by him against one of five persons who had underwritten an insurance policy on his car.

According to a report in the *Horwich Chronicle* his claim was in respect of a fracture of the chassis frame brought about, it was maintained, by one of the wheels of the car falling into a deep rut on a hill which the plaintiff was descending on his return from a night visit. The underwriters refused payment on the ground that the fracture was a mechanical breakdown and not an accident, and put forward this plea in court. The plaintiff having described the accident and his investigation of what had occurred, evidence on his behalf was given by a surveyor to the effect that the hole described, which was probably caused by recent heavy rain, did exist; while a motor engineer stated that the chassis had given way where he would expect it to give way if the frame were subjected to an abnormal shock.

The court, in giving judgement for the plaintiff, remarked that if the contention of the underwriters was correct, it would follow that a plea of mechanical breakdown would be an effective defence even in respect of such an event as the breaking of the stearing gear through a collision between two cars.

The sum claimed and awarded was £2 8s., this being one-fifth of the total claim against all the five underwriters, only one of them being summoned by way of testing the position of them all.

Small Cars.

In reference to the inquiry from "Cornubiensis" and the letters of other correspondents, mention may be made of a small car built by Pilot Motors, Limited (Loudoun Road, St. John's Wood). We recently had an opportunity of trying it on the road, and this trial, though not exhaustive, was sufficiently long to satisfy us that the car is worth attention from those in search of a small, light car, either for habitual use or to save the wear and tear of their ordinary car. The car tried was not a new one, but had already been run approximately 12,000 miles. Throughout it had been driven by its owner, a private individual, who, although unable to state precisely what sum had been spent on repairs, assured us that, beyond one set of tyres costing £10, the maintenance charges had been quite trifling. Benzol was chiefly used, its consumption averaging one gallon for every thirty-five miles, the work done being partly in a very hilly city and partly over hilly country roads. As those interested can obtain full particulars for themselves, we merely mention the qualities by which we were particularly struck. These were that the car was almost absolutely noiseless at all speeds, that the speeds available ranged from a very slow walking pace on the bottom gear to between 30 and 40 miles on the fifth gear with the throttle open, that only towards the top of one very long hill was a change from the the top gear necessary, and that the car could be manœuvred with great ease. The engine is a water-cooled, four-cylinder Chapuis-Dornier, fitted with a Zenith carburetter, which is operated by a Bosch magneto. The two-seated body has a hood and allows plenty of room for the legs. Mechanically the distinctive feature of the car is that the engine power is transmitted to the back axle neither by bevel nor worm drive, but by a shaft disc and friction wheel. Friction transmission of power is, of course, exceedingly common in factories, but hitherto has been rarely used in car construction except in connexion with clutches. Its advantages are that it gets rid of a good deal of weight and expense and makes gear changing very easy, but whether as experience in the building of small cars accumulates its use will spread remains to be seen. The roads over which we tried this particular specimen of the Pilot were very good, and its work had usually been confined to good roads. Its cost is £150.

The Motor Shows.

The twelfth Olympia Motor Show organized by the Society of Motor Manufacturers and Traders will be opened on Friday, November 7th. The number of firms showing cars and chassis will be 119; the total number of firms exhibiting will be raised by those engaged in coach building and the provision of accessories and tyres to 349. The majority of the exhibits of cars will, it is stated, reveal only a slight collective modification. Four-cylinder engines will predominate, and it is found that monobloc casting has been generally adopted. The exhibition will close on Saturday, November 15th. The Motor Cycle and Cycle Car Show will be opened at Olympia on November 24th and continue until the 29th.

Arrangements have been made to publish descriptions of both shows, and it is intended to print an anticipatory article on the Motor Show in the issue of the Journal of November 8th.

LITERARY NOTES.

The autumn list of new books published by the Walter Scott Publishing Company, Ltd., includes *Influenza: Its History, Nature, Cause, and Treatment*, by Arthur F. Hopkirk, M.D. (Jena).

In Mr. Murray's Quarterly List of Forthcoming Works (October) we note a new edition of Sir Lauder Brunton's *Therapeutics of the Circulation*, and one (the eleventh) of Professor Halliburton's *Handbook of Physiology*. This is the twenty-fourth edition of "Kirke's."

Dr. G. Walter Steeves, whose *Life of Francis Bacon* was favourably reviewed in the British Medical Journal of June 17th, 1911, p. 1430, has recently published, through Messrs. Chapman and Hall, a book entitled *Some Main Issues*. In it he endeavours to illustrate some of those conditions which influence, directly or indirectly, individual life at the present day, and to study the origin of certain defects in the training and aspirations of children and students. An effort is also made to emphasize the responsibilities of those who undertake the education of the masses, and more especially the instruction of the young. While school examinations, recreations, and academic methods are discussed in their different phases, the obligations of the State with reference to its literature, ancient books and manuscripts also receive serious consideration.

It is now generally known that Leonardo da Vinci, that almost universal genius, was one of the pioneers of anatomy. He left a number of anatomical drawings with descriptions, which are now in the Royal Library at Windsor, after lying hidden in the Ambrosia Library, Milan, for centuries. By permission of the King photographs of these, with English and German translations of the descriptions, have been prepared by Ove C. L. Vangensten, A. Fonahn, and H. Hopstock, and published by Jacob Dybwad, of Christiania. Dr. Hopstock is prosector of anatomy in the University of Christiania, where Dr. Fonahn is professor of the history of medicine, and Mr. Vangensten professor of Italian. The first volume (*Quaderni d'Anatomia I*), published in 1911, contains 13 folios, 22 pages in facsimile (collotype), and 70 designs. The subjects illustrated are respiration, the alternating motions of the diaphragm and the muscles of the abdomen, together with the passage of the food through the alimentary canal, and the heart. A special volume on the heart (*Quaderni d'Anatomia II*), containing 24 folios, 33 pages in facsimile (collotype), and 240 design , was published in 1912. The third volume, which appeared in September of the present year, consists of 12 folios, 20 pages in facsimile (collotype), dealing with the organs of generation. The remainder of the hitherto unpublished Windsor papers will follow, one volume appearing annually in September. The whole work will comprise six volumes. Leonardo intended to produce a treatise on anatomy, but this intention does not seem to have been carried out. The specimens we have seen show that the drawings are of great beauty. The work is dedicated by permission to Her Majesty Queen Maud of Norway, through whose kind offices permission to photograph the drawings and publish the work was obtained. The Professor Voss Prize has been awarded to the editors by the University of Christiania.

A monument has recently been erected in the small cemetery of Ferney, near Geneva, in memory of the well-known doctor poet Jean Lahor, who died in 1910. His real name was Henry Cazalis, and he practised at Aix-les-Bains and in Paris. In 1870 he worked among the sick and wounded at Versailles. He is said to have prevented the palace of Louis XIV from being occupied by the Prussian King by the simple device of transferring there a number of men suffering from typhoid fever. He was the author of *Chants de l'amour et de la mort*, *Heures Sombres*, *Chants Panthéistes*, *Vers Stoïciens*, *L'Illusion*, and *Quatrains d'Al-Ghazali*. In all these he gives proof of an exquisite poetic gift. His stimulating and lofty thought, conveyed in melodious verse, may be taken as an example of that philosophy which Milton described as—

> Not harsh and crabbed as dull fools suppose,
> But musical as is Apollo's lute,
> And a perpetual feast of nectared sweets
> Where no crude surfeit reigns.

Dr. Cazalis was also the author of writings on medical subjects, of which the best known is *Science et Mariage*.

British Medical Journal.

SATURDAY, OCTOBER 25TH, 1913.

THE ABUSE OF OPIUM, MORPHINE, AND COCAINE.

EVIDENCE has of late come from East and West alike of the urgent need for some international co-operation with a view to restrict the illicit traffic in opium, morphine, and cocaine. China, with the election and recognition of the President of the Republic, it is hoped, will now pursue, under more tranquil conditions, the war against opium commenced under the Manchu dynasty. The dispatches from Sir J. Jordan, published in a parliamentary paper (Cd. 6876) last July, indicated that, while there had undoubtedly been a recrudescence of poppy cultivation during the disturbed period of the revolution in several provinces, the rigid methods adopted by the military, aided by fine, imprisonment, and summary execution, had eradicated poppy culture in several other provinces, and had considerably restricted the practice of opium smoking. The provinces of Anhui, Hunan, and Shantung having been proved to have effectively suppressed the cultivation of the poppy, are now, in accordance with Article 3 of our agreement with China of 1911, closed to the import of Indian opium. The efforts of General Chang and of the members of the House of Commons who have taken an interest in the matter seem to have failed to prevent the unloading into China of stocks of Indian opium in the Chinese treaty ports. Nevertheless, the cultivation of the poppy in India will, we are assured, in future be reduced to what is deemed necessary to meet the extra-Chinese demand.

In September the St. Petersburg correspondent of the *Times* gave currency to a disquieting rumour that an English syndicate had been formed to acquire a concession to import opium into Mongolia. It was darkly hinted that the opium in question would be of Indian origin, and that the Chinese in Mongolia were to be its consumers. Another market for Indian opium is apparently to be established in Hong Kong as a Government monopoly. The acting Governor, in a recent address to the Legislative Council on the Budget for 1914, intimated that the Government was about to take over the premises, appliances, and staff from an opium farmer in the colony, and to contract with the Government of India for the supply.

While the Government of India is evidently embarrassed by the glut of opium it is producing, and is seeking with more or less success for legitimate outlets for its stocks, India appears to be also the dumping ground for illicit imports of cocaine. More severe legislation is being demanded against what is a great and growing evil among Indians of all classes. In a recent trial in Calcutta the second presidency magistrate stated that "many people are in gaol owing to the horrible craving produced by cocaine. The number of homes it has broken up and the lives it has ruined are incalculable." Medical officers of asylums in India have testified to the yet greater potency of cocaine than opium or morphine in causing moral insanity of the worst type. The maximum penalty for smuggling the drug is three months' imprisonment, which is said to be quite inadequate, since enormous profits are secured by the smugglers, some of whom are believed to be very wealthy men. Last month a case was heard in court in Calcutta against a European smuggler, in the course of which a letter was produced addressed to a London firm suggesting "quinine cases" instead of old clothing as the best means of surreptitiously consigning the illicit drug. More recently still a case containing eighteen tins of cocaine was confiscated at Bombay. Each tin contained 16,000 grains, of a total value of £2,666.

The distribution of the cocaine vice, like that of morphine, is, however, world-wide. It is an Occidental as well as an Eastern question. The recent death of an English baronet in Montmartre called renewed attention to the growth of the drug habit in Paris. Hardly a week, it is said, passes without the report of the death of some student or *demi-mondaine* from an overdose of opium, ether, or cocaine. An opium smoking establishment at Vésinet, a suburb of Paris, was recently raided by the police in consequence of the death there of a prominent figure of the Paris *demi-monde*. Death was due to cocaine *plus* ether and opium-smoking, and the establishment, to which wealthy Parisians and foreigners resorted was evidently a rendezvous for those addicted to these vices. Early this year, as was noted in the JOURNAL at the time, the extensive use of cocaine in certain night restaurants in Montmartre, where it was hawked by flower sellers, and even openly, was the subject of discussion at two of the medical societies in Paris, and it was stated that the Procurator of the Republic had called the attention of the police in the department of the Seine to the fact that in certain quarters of the city it was possible to buy cocaine, opium, or morphine without any difficulty, contrary to the provisions of the law with regard to poisons passed in 1908. It is now reported that, no doubt in consequence of this intimation, a vigorous raid has been recently made by the Paris police in Montmartre which has led to the arrest of a gang of men engaged in the traffic and to the seizure of large stocks of morphine and cocaine.

All this unsavoury evidence serves to enforce the need for that stringent international control of these drugs which it is the object of the International Opium Convention of 1912 to secure. That Convention still awaits ratification by some Powers. As pointed out in the JOURNAL of July 19th (p. 140), thirty-four Powers had then signed the Convention. We understand that since that date Uruguay, Peru, Norway, and Sweden have also signed. Outside the Balkan peninsula, where other questions are dominant, only Switzerland and Austro-Hungary have failed up to now to give in their adhesion. At the Interparliamentary Conference at The Hague last month M. Cremer (Holland) and Sir William Collins (Great Britain), who had both been delegates at the first and second Opium Conferences, urged again the importance of securing general international co-operation in order that the Convention might be speedily put in force. The *Gazette de Lausanne* of September 26th contained a strong appeal to the Swiss Government to join in this humanitarian work, and we cannot believe that either Austro-Hungary or Switzerland will desire to postpone the beneficial results which must flow from the ratification of this important treaty.

THE STRUCTURE AND COMPOSITION OF RED BLOOD CORPUSCLES.

A vast amount of work on the structure and composition of the red blood corpuscles has been done during the last five-and-twenty years. Yet they remain problems as obviously with us as are the poor. Micro-chemical research has not done a great deal to elucidate them, for the various methods of fixing or of staining that have been employed, though often most useful in the case of abnormal or degenerated red cells, tell us comparatively little about the normal red cell. For example, Maurer's dots or clefts may be seen in red corpuscles infected with the parasites of malignant tertian malaria, and Schüffner's dots, coloured red by Romanowsky's stain, in the cells similarly infected by the parasites of benign tertian malaria; in each case the dots are regarded as evidence of degenerative changes that have taken place in the stroma of the blood corpuscles. Analogous granulations have been less often described in the red cells of normal persons, or in those of the victims of various disorders of the blood, and here, again, have been taken to indicate processes of degeneration. But, as Buckmaster points out, polychromatophilia (or the possession of granules demonstrable by certain staining reagents) occurs physiologically in the developing blood of the embryo, and there are good reasons for supposing that granulation may be evidence of regenerative processes, of repair and not destruction, going on in the red cells in which it is seen. The difficulties here are enhanced by the uncertainty that inevitably attaches to the interpretation of things seen in blood slides fixed and stained and mounted; how far such appearances are artefacts and how far natural is constantly in dispute.

The methods of physiological chemistry are equally disappointing when applied to the structure and composition of the red blood corpuscle. They tell us the quantities and composition of the various compounds that make up a mass of red cells that have been killed, and also give information as to the products of the metabolism of the living cells, but leave us in the dark as to their structure and constitution during life.

Finer methods of analysis and investigation are required for the study of the individual cell, and these have been furnished in abundance by various modes of physical examination, and osmosis, electrical conductivity, depression of freezing point, may be particularly mentioned in this connexion. As a result of the great variety of experiments that have been made, one may conclude that the red cell has a surface layer of variable permeability, an envelope or membrane, containing a stroma or endosoma, of which from 86 to 95 per cent. is composed of haemoglobin. The envelope is semipermeable, impregnated with a layer of a compound of cholesterin and lecithin, according to Overton's view, permitting the entrance of substances soluble in the lecithin and cholesterin it contains, impermeable to other substances, such as neutral salts and sugars. It is quite uncertain in what form the haemoglobin, or the several kinds of haemoglobin as Bohr puts it, exists inside the red cell. Only a part of it can be in solution; Buckmaster supposes that the rest can only be in some amorphous condition; Hoppe-Seyler suggests that it is present as a compound with lecithin. Besides haemoglobin the endosoma, or inside of the red cell, contains small percentages of protein, fat, lecithin, cholesterin, and inorganic salts.

Dr. E. M. Brockbank has recently published[1] a paper in which he describes a new method of attacking the problem of the structure and composition of red blood corpuscles. It is quite simple, demanding nothing beyond a microscope, blood smears, and acid pepsin solutions for its employment. Normal blood is smeared in the ordinary way on microscope slides, fixed in alcohol or formalin vapour—the method of fixation adopted makes little difference to the results obtained—or in Leishman's stain. The slides are then exposed to solutions of an active form of pepsin, acidified to a greater or less extent by hydrochloric acid. The results obtained vary with the degree of the acidity, and can be readily observed under the high power of the microscope (one-sixth of an inch). Three main phenomena are to be seen, according to the acidity of the pepsin solution that is allowed to act upon the red cells. If the strength of the hydrochloric acid present is small, say 0.005 per cent., the red cells become more opaque, roughened, and changed in their staining properties. A more strongly acid solution of pepsin causes early digestive changes in the cells that result in a process called "ballooning" by Dr. Brockbank; the whole corpuscle is seen to swell up rapidly until perhaps four times its normal diameter, as if distended with colourless fluid, or, less often, with granular material. This "ballooning" appears readily in a dried unfixed smear that has been laked by breathing on it. Here the laked corpuscles can be seen as colourless discs, the escaped haemoglobin lying outside them; a suitably acid solution of pepsin causes these colourless discs to "balloon." The phenomenon suggests that the envelope of the red cells is distended by the endosmosis of fluid; or that both the envelope and the uncertain substance that is supposed to unite the envelope and the haemoglobin together swell up to form the "balloon." The appearances suggest at any rate that the wall of the red corpuscle has a considerable thickness of substance in it, and is stouter than the ghost form left behind after osmotic haemolysis. If the pepsin solution has an acidity of about 0.01 per cent. of hydrochloric acid, in a few seconds the red blood corpuscles can be seen to put out a greater or less profusion of granules that are amorphous, opaque, apparently brownish, and insoluble. Dr. Brockbank calls this appearance "granulation," or "visible haemolysis"; if it goes on long enough all traces of haemoglobin vanish from the red cells, which remain as ghosts or shadows, so called. The composition of the granules he is not able to determine; their profusion and bulk make it unlikely that they consist of haematin, and he suggests that they may be a compound of haemoglobin with some other body, possibly lecithin. No "ballooning" can be obtained after a corpuscle has lost its contents by "granulation."

Another observation that Dr. Brockbank has made is that, if a blood smear be made on a hot glass slide, the red cells will be found much altered in shape. There are masses formed apparently by the coalescence of two or more red corpuscles, and there are other bodies like fragments of corpuscles. Both large masses and fragments show the phenomena of "ballooning" and "granulation," and the haemoglobin in them can be dissolved out by breathing on the slide. Dr. Brockbank concludes from these facts that live unfixed red blood corpuscles, like soap bubbles or globules of oil, possess the power of coalescing under certain conditions to form larger masses, and of forming smaller complete globular bodies when fragmented. Their limiting envelope must be albuminous or lipoid in nature, and cannot have a histological fibrous structure like that of the

[1] *Medical Chronicle*, Manchester, 1913, 4 S., xxv, 287.

envelope of fat cells. This would appear to be direct evidence in favour of Overton's view, or some similar view, of the structure of the envelope of the red cells. As regards the internal economy, the inner structure of the red cell, Dr. Brockbank reiterates his view of the origin of the blood platelets. These, he says, are extrusions from red blood cells. They arise from the interior of these, and can be seen in the red corpuscles and in the mouths of burst red corpuscles. Their appearance in the latter situation suggests that they come from a single cavity, and not from a sponge-like structure such as has been believed to hold the haemoglobin netted in its reticulations.

To summarize the chief conclusions drawn from this interesting paper, it would seem that there is some outer structureless material on a red corpuscle that is removed by strongly acid pepsin solutions. Inside this lies the true envelope of the red cell, devoid of histological structure, capable of coalescing with similar material in other red cells to form a bigger mass, and capable of fractionation into smaller masses. Within this again is the haemoglobin, not in watery solution at all, perhaps linked to the envelope by lecithin. And within the capsule of envelope and haemoglobin lies the material that is extruded to form the blood platelets, perhaps also the bodies which exhibit Brownian movements in fresh preparations of living blood and the so-called "spirochaetes" of normal blood.

THE PERILS OF COAL DUST.

Mining engineers as well as the public will await with some impatience the result of the inquiry into the cause of the explosion which has wrought such appalling havoc in the heart of the Welsh coalfield. The nature of the igniting force is still a mystery, but, whatever the immediate cause, there seems little doubt that the magnitude of the disaster was due to the inflammable coal dust formed in the haulage roads, and not to the so-called fire-damp or gas given off from the coal seams. When a pit disaster, like that at Senghenydd, involves great loss of life, and inferentially a wide area of destruction, it may almost be taken for granted either that coal dust is the sole agent or that it has greatly extended and intensified the original explosion. In by far the larger number of colliery explosions fire-damp is the cause, and no trace of the action of coal dust is to be found; but these explosions are usually of a local character. It is the coal dust, creating as it does waves of explosive energy along the roadways of the mine, which is usually responsible for such devastation as occurred at Senghenydd. The direction of the explosion wave in this latest calamity is held also to favour the coal dust theory. The mine is said to have been exceptionally well ventilated, and while such ventilation may prevent the accumulation of gas in the workings and, apart from sudden gaseous outbursts, act as a safeguard against the dangers of fire-damp, it may also stir up the dust, and thereby fulfil one condition for an explosion of a different kind. Unfortunately, as coal mines become deeper and drier, and consequently more dusty, calamities on this scale must be expected until some practical method of dealing with the accumulated dust has been devised. Experiments with those objects in view have been in progress on a large scale for some years under the direction of a special committee. They have confirmed the opinion as to the extreme danger of coal dust, but it does not seem that they have yet yielded results applicable on a large scale to an actual coal mine. The report of the disaster at the same colliery in 1901, when an explosion in the adjoining "district" caused a death roll of over seventy, only one entombed miner escaping, shows that though the cause was obscure, the explosion travelled through all the main roads, with the exception of a few portions naturally damp; it penetrated into what are called the stall roads and working-faces in each district, but avoided the principal return airways. In this case, again, there was evidence that the mine was dry and dusty throughout. It is only within recent years that the possibility of coal dust playing the leading part in mine disasters has been fully admitted, but the report of the Royal Commission on Mines (1909), not to speak of earlier pronouncements, made it abundantly clear that under certain conditions coal dust suspended in air may explode not only with but without the presence of fire-damp. To cause the disaster the dust must be dry and finely divided, some of it being suspended in air like a dense cloud, and an igniting medium of reasonably high temperature must be projected into it. Frequently this igniting medium is the flame produced during shot firing, and on the occasion of the disaster in this colliery twelve years ago, Professor Galloway came to the conclusion that the explosion was caused by the firing of a shot without any attempt being made to water the locality. In the present instance, however, it seems to have been proved that there was no shot firing. This theory being abandoned, there are a number of others, such as a defective lamp or a fused cable, but it has previously been regarded as scarcely likely that a naked light or an ordinary flame could cause an explosion of coal dust alone. The possibility of a small originating explosion of fire-damp cannot be disregarded, for fire-damp is rarely, if at all, absent from the pit, and it may liberate energies which are greater than its own. Of the preventive measures suggested, the admixture of stone dust has attracted some attention during the past few years, but the limits of safety within which even a non-combustible dust may be used on the mine roadways are still unknown. As the result of the recommendation of the Royal Commission on Mines provisions were introduced into the Coal Mines Act, 1911, directing that in mines where the floor, roof, and sides of the roads are not naturally wet throughout there should be a daily inspection and written report on the conditions of the roads as to coal dust, and of steps taken to mitigate dangers arising therefrom. A further provision directed that systematic steps, either by way of watering or otherwise, to prevent explosions of coal dust occurring or being carried along the roads, should be taken in accordance with regulations to be laid down. The Home Office Committee on explosions in mines has presented four reports, and it is understood that its fifth, which has been for some time expected, would deal with this matter of regulations; so far, however, no regulations have been issued. In the United States the introduction of moisture into the mine, either by means of water sprays or by humidifying the intake air current with exhaust steam sprays, has been recommended, but in the British coalfield the mine temperatures are said to be from 15 to 20° F. higher than in the American. The fear has in consequence been expressed that humid air conditions would make our mines, which at present, apart from accident, are remarkably healthy, the breeding ground of disease. Death dogs the miner's footsteps; cheated in one direction, it exacts its toll in one fell swoop in another.

THE INSURANCE DIFFICULTY IN GERMANY.

From the summary by our Berlin correspondent of the conditions created by the amendments of the Insurance Act in Germany, published last week (p. 1029), it will have been seen that the main cause of dispute between the doctors and the societies arises in connexion with questions affecting the free choice of doctor and the capitation fee. The new law, which comes into force on January 1st, 1914, does not determine these points, but leaves them to be settled

between the interested parties. For some weeks past the negotiations between the Leipzig union of doctors, together with the medical societies' federation (Aerztevereinsbund), as representing the medical profession, and the insurance societies and clubs (Betriebkrankenkassenverband), have been carried out with good promise of success, owing chiefly to the very moderate position taken up by the doctors. It was recognized that it would be an unwise policy to seek to impose conditions which the societies would have financial or administrative difficulties in carrying out. The principle of the free choice of doctor was modified in the hope of making it acceptable to the managers of the societies, and the question of remuneration was also treated in a spirit of great moderation. The local meetings and the conferences between the representatives of both parties appeared to be making good progress toward a satisfactory solution. But on October 13th the Leipzig Union issued a communication to the press stating that the societies had peremptorily refused to continue negotiations with the doctors in regard either to the free choice of doctor or to the question of remuneration. A special meeting of the Aerztetag (representative meeting of the medical profession) has been called for an early date to determine the policy to be followed. It appears that the societies have no desire to meet the reasonable demands of the profession, but intend to follow a policy of repression, attempting to carry on the administration of the Act with a high hand. It is further equally certain that the doctors are sufficiently united and in earnest to fight solidly for their elementary rights, and to hold out for the terms which they have already put forward. In a concise and illuminating account of the new Insurance Act,[1] Geheimrat Professor T. Rumpf has pointed out that the advantages of the Act for the masses in regard not only to efficient treatment of disease, but also to prevention, can only be attained when the conflict between the doctors and the insurance societies is ended. He contends that the chief difficulties lie in the standardization of the contracts which each insurance doctor is required to sign. It is suggested that the form of contract should be drawn up by the Leipzig Union, so that with its solid backing the individual practitioner will be in a position to require and obtain reasonable terms of employment. The Leipzig Union at present seems inclined to await the course of events, as the failure to reach a settlement was due to the other side. Meanwhile there is no course open to the union but to call upon the profession to hold out for its very moderate and just demands. In other words, the doctors will not accept service on January 1st unless the societies come round. If the latter remain obstinate, the Government will be compelled to intervene, and stranger things might happen than the fixing of the conditions of the contracts for medical service by the Government, on lines which the profession would be willing to accept.

[1] *Arzt u. R.V.O.* (Reichs-Versicherungs-Ordnung). By Geheimrat Professor Dr. Th. Rumpf. 1912. (Bonn: Marcus and Weber).

THE LONDON HARVEIAN FESTIVAL.

THE Harveian festival of the Royal College of Physicians of London was celebrated on St. Luke's Day, October 18th. In the afternoon the Harveian oration was delivered by Dr. J. Mitchell Bruce. The subject of the oration was the origin and nature of fever, and the orator reviewed the history of the doctrines of the causes of fever from the death of Harvey to the present time. The subject, he said, had been studied from two different points of view—by those who were concerned with armies and with slums and gaols, and by those engaged in hospital and private practice. The studies of the former had been directed especially to the etiology and of the latter to treatment. Harvey's writings contained thoughts on the natural history of life and disease. There was a passage in the *De Generatione* which related to "the manner in which epidemic, contagious, and pestilential diseases scatter their seeds and are propagated to a distance through the air, or by some forms producing diseases like themselves in bodies of a different nature, and in a hidden fashion silently multiplying themselves by a kind of generation." Harvey alone of all the observers in two centuries had offered an experiment instead of an opinion. His experiment was, after pricking his finger with a clean needle as a control observation, to rub the same needle on the mouth of a spider and prick the hand in another place. The result was that "the part pricked with the envenomed needle immediately contracted into a tubercle, and by and by became red and hot and inflamed, as if it collected and girded itself up for a contest with the poison for its overthrow." The experiment, Dr. Mitchell Bruce said, was perfect in its kind, proving, as Harvey put it, that "the flesh itself readily distinguishes a poisoned wound from one that is not poisoned." He had also made observations of the organs of defence and escape in animals, concluding that "to those animals to which Nature has given vast strength she has also presented weapons in harmony with their powers; to those that are not thus vigorous she has given ingenuity, cunning, and singular dexterity in avoiding injury." This sentence, the orator pointed out, outlined in a few words the automatic, instinctive, and voluntary defences possessed by the individual for the struggle of existence. Harvey had also forecast the correlated law of sexual selection in the following sentences: "Ornaments of all kinds, such as tufts, crests, combs, wattles, brilliant plumage, and the like, to say nothing of such offensive weapons as teeth, horns, spurs, and other implements employed in combat, are more frequently and remarkably conferred upon the male than the female . . . the subject of dispute being no empty or vainglorious matter, but the perpetuation of the stock in this line or in that, as if Nature had intended that he who could best defend himself and his should be preferred to others for the continuance of the kind." Dr. Bruce then pointed out that these brief discussions of fundamental principles constituted a single great conception in which Harvey by way of experiment and intelligent observation came near to unlock the very inmost of Nature's secrets, the relativity of life, the reaction of man to the influences of his environment, whether favourable to his existence and health or unfavourable to them—constituting the causes of disease and death. This conception was alone sufficient to justify the admiration and reverence which the College entertained for the man whose work and character was its chief glory. The Baly medal was presented by the president to Dr. John Scott Haldane, F.R.S., reader in physiology in the University of Oxford. The medal was founded by Dr. Frederic Daniel Dyster in 1866 in memory of William Harvey, and is awarded every alternate year on the recommendation of the president and council to the person deemed to have most distinguished himself in the science of physiology, especially during the two years immediately preceding the award. It is not restricted to British subjects; the last five recipients were Professor J. N. Langley, F.R.S. (1903), Professor Pawlow of St. Petersburg (1905), Professor E. H. Starling, F.R.S. (1907), Professor Emil Fischer of Berlin (1909), and Professor W. D. Halliburton, F.R.S. (1911).

PORTRAITS OF WILLIAM HARVEY.

No one can read about famous men and women—whether the fame be good or bad—without feeling some curiosity as to their personal appearance. Carlyle somewhere says that a historian should spare no pains to procure portraits of the people of whom he writes, for even in the worst likeness, if it be genuine, there are to the seeing eye revelations of character. But in the case of many of those

who have left their mark in one way or another on the history of mankind we are often perplexed by the variety of pictures of greater or less authenticity labelled with their names. The so-called portraits of Shakespeare are grotesquely unlike each other, and none of them conveys the idea of the foremost man in all literature. The portraits of Mary Queen of Scots, again, are still more discordant, and scarcely one of them has a trace of the beauty which made men ready to die for her, and the very tradition of which even now disorders the judgement of serious historians. In a spirit of pious reverence the Historical Section of the Royal Society of Medicine has had photographs made of such portraits of William Harvey as could be found, and has published reproductions of them in a handsome volume.[1] The collection, to quote from the preface, "proves that the undoubted and contemporary portraits of Harvey are more numerous than was expected, either because 'the honest little Doctor' liked to have his picture painted, or, as is the more likely, because he could not resist the importunity of artists whom he must often have desired to help pecuniarily." It is added that there are also several pictures of gentlemen of the seventeenth century with peaked beards and white collars which are labelled with Harvey's name. These spurious portraits can, it is said, be divided into two groups—those which may have been portraits of Harvey's brothers, supposing that a family likeness existed, and those which are clearly not members of the family. In the volume now issued the genuine portraits are arranged in the order of apparent age. We have a description of how Harvey looked in the eyes of his contemporaries in 1616 when he was 37 years of age. "A man of the lowest stature, round faced, with a complexion like the wainscot; his eyes small, round, very black, and full of spirit; his hair as black as a raven and curling; rapid in his utterance, choleric, given to gesture, and used when in discourse with anyone to play unconsciously with the handle of the small dagger he wore by his side."[2] Seventeen portraits are reproduced in the volume with a loving care that gives it an artistic as well as a historic interest. There is a brief but sufficient description of each picture, with an account of its history as far as that can be traced. Not all the portraits are genuine, as is, indeed, clear even to those who have no special knowledge. The first in order, which was bequeathed to University College, London, by Mr. George Field, and is said to have been in the possession of Mr. John Linnell Bond, architect to Sir E. Harvey, to whom it descended through William Harvey's second brother, is attributed to M. C. Mierevelt (1567–1641). It is a fine picture, but is certainly not a portrait of the discoverer of the circulation of the blood. Again, there is what is called the Rolls Park portrait, which is in the possession of General Sir Francis Lloyd. It was removed from Rolls Park, Essex, to Aston Hall, Salop, by Captain Richard Lloyd, a lineal descendant of Harvey through his mother, a daughter of Admiral Sir Eliab Harvey. It is said to be doubtful whether the portrait was ever intended to represent William Harvey, and it certainly, as Carlyle said about one of the portraits of John Knox, is difficult to see in the face of this somewhat commonplace "eupeptic" gentleman any trace of the deep thought, still less of the melancholy, which marks the genuine portraits, however these may differ in other respects. The picture from the Erich Gallerics, attributed to Janssen and bought at a sale by Mr. Erich, is another doubtful portrait; we are inclined to look with the same doubt on the portrait in the possession of Mr. John P. Cobbold, of Holywell, Ipswich. Of the genuine portraits, the most pleasing is one in the possession of James Franck Bright, D.D., formerly Master of University College, Oxford, and a son of Richard Bright. It is attributed to Van Dyck. It has a coat of arms with a crest consisting of a lighted candle around which two serpents are entwined; underneath is the motto, *Più arde più splende*. We do not quite understand the interpretation given—più (H)arde più splend(ide); the words are Italian, plain if not choice, and mean, "The more it burns the more it shines." What language "(H)arde" is supposed to be we confess we cannot guess. Harvey himself in his notes wrote a jargon of English and dog Latin, but that is scarcely a sufficient reason for mixing Italian and Latin in his motto. The Royal College of Physicians has two portraits. One of these, which represents Harvey about the age of 50, was bought for the College by the late Dr. Frank Payne. The name of the artist is not given. The face is that of a man in the fullness of his intellectual powers; it has something of the expression of a thoughtful Cavalier. The other portrait is by Cornelius Janssen, and its authenticity may be accepted, as it is one of the three pictures saved from the Great Fire of London in 1666, which destroyed the College then situated in Amen Corner. It is thought possible that the portrait was expressly painted for the College, and that it may have been a gift from Harvey himself. It represents an older man than the other portrait. The genuine portraits show that Harvey had a long face with refined features; his hands, which were long and thin, well fitted for delicate dissection, are treated with special care by the better painters. It is interesting to trace the deepening melancholy of the face as years brought increasing sadness from the *turbarum plena respublica* and the feeling that he himself was on the high seas. Harvey was a devoted adherent of Charles I, and after the execution of the King the famous physician, who had been rather a dandy, always dressed in sombre raiment. The Historical Section of the Royal Society of Medicine is to be congratulated on the zeal and devotion to the objects for which it was founded in producing with rare perfection a work which, though a thing of beauty in itself and valuable to all students of medical history, makes little appeal to the general.

[1] *Portraits of Dr. William Harvey.* Published for the Historical Section of the Royal Society of Medicine by Humphrey Milford. London: Oxford University Press. 1913. (Dbl. roy. 8vo, pp. 55, 21s. net.)

[2] D'Arcy Power: *William Harvey.* Masters of Medicine Series. London: T. Fisher Unwin. 1897.

NOGUCHI'S CUTANEOUS LUETIN REACTION.

Ladislaus Benedek[1] has recently reported observations on the reaction with Noguchi's luetin in general paralysis and in cerebral syphilis. He injected 0.07 c.cm. of luetin, mixed with 0.03 c.cm. sterile physiological saline solution, 4 to 5 mm. deep into the skin by means of a very fine needle. When the reaction was negative, a small weal measuring 2 to 3 mm. in diameter formed after a few hours; it became paler during the following twenty-four hours, but might still be felt as a minute papule for four or five days. In a few cases very minute haemorrhages took place around the puncture in negative cases. When a positive reaction occurred, vivid redness and marked prominence of the papule developed within the first twenty-four hours. At times the area became oedematous within forty-eight hours, but, as a rule, the reaction was most distinct on the third or fourth day, the area having increased in size and having become prominent. In some instances a pustule formed in the centre. These characters, including pustulation, were well illustrated by a set of slides shown by Noguchi during his demonstration at the Royal Society of Medicine this week. He considers that the reaction should not be considered positive unless the characters are well marked on the sixth day. Benedek, however, maintains that the prominence, the formation of a good areola and pustule, the intensity of the discoloration, and the duration of the development and involution may be regarded as the criteria, without definitely requiring that the conditions shall be of a certain kind on a certain day. Of 81 cases of progressive paralytic

[1] *Muench. med. Woch.*, September 16th, 1913.

dementia, 65 (80.4 per cent.) gave a positive reaction, while of 10 cases of dementia praecox only 1 gave a weak reaction. In 3 cases of cerebral syphilis the reaction was extraordinarily well marked; on the fifth day the areola measured from 3 to 5 cm. in diameter, and in the centre of this a dark red papule of the size of a hazel nut was seen. The edges of the papule gradually faded off into the inflamed oedematous surroundings. Vesicles formed on the seventh day, and the contents—a thick, brownish-yellow fluid—discharged between the eighth and tenth day, after which involution began. A papule could still be felt after three weeks, and the skin was then markedly discoloured. Benedek has not observed such a strong reaction in any case of general paralysis. He suggests that this striking form of cutaneous, or rather intradermal, reaction may possibly prove useful in the differential diagnosis of general paralysis of the insane and cerebral syphilis.

THE ABORTIVE TREATMENT OF SYPHILIS.

The discovery of the spirochaete of syphilis, the introduction of the complement deviation test for the diagnosis of the disease, and the discovery of salvarsan for its treatment, have together given an impetus to the study of the possibility of cutting short the attack while the infection is still in the earliest stage. That Ehrlich's aim at complete and immediate sterilization failed does not necessarily mean that attempts at an abortive treatment should be given up as hopeless. Zürn,[1] in a recent paper, shows that the abortive treatment of syphilis has, in the hands of various clinicians, met with a not inconsiderable success, and relates his own experience in Lesser's clinic. The attempt was only made in cases in which there was a primary chancre with spirochaetes, a negative Wassermann reaction, and no secondary symptoms. This practically meant an early infection and a certain diagnosis. The cases were treated either with salvarsan alone, or with mercury alone (calomel, or at times mercury salicylate or perchloride), or a combination of the two; 11 patients were treated with salvarsan alone, 17 with mercury alone, and 25 with a combination of the two. In 19 of the 53 cases, the attempt definitely failed. Success was definitely obtained in 4 cases, while in the remaining 30 the time is still too short to admit of deductions. The first patient of those successfully treated received calomel and salvarsan, and the chancre was excised. The proof of the cure was a reinfection eight months later, which was also treat d by the same method, so far without the appearance of secondary symptoms or a positive Wassermann reaction. The second patient was treated with old salvarsan alone. No indications of syphilis have presented themselves during the thirteen months which have elapsed since the treatment. The third patient was treated with three injections of neo-salvarsan, and has remained free from symptoms for fourteen months, and has a negative Wassermann test. The fourth patient was treated with calomel alone. He, too, has remained free from all indication of infection for fourteen months. Before expressing a positive opinion as to the result of the treatment, Zürn considers it to be essential to keep the patient under observation for at least one year and to test the serum for the Wassermann reaction every two or three months. He recognizes that the chances of success of the abortive treatment are not very good, but when the cases can be got early enough the attempt to stop the disease before the infection becomes general is justifiable.

THE THERAPEUTIC USE OF THORIUM X.

O. Mesrth,[2] who has used thorium X in the treatment of various diseases in Erlangen, recommends beginning with small doses except in leukaemia, where he recommends from the first a comparatively large dose, which may be increased. He advises 300 to 400 electrostatic units (1 electrostatic unit = 1,000 Maché units) to begin with; the highest dose he has yet given is 1,000 electrostatic units. In pernicious anaemia great care must be exercised, and he usually begins in such cases with from 10 to 70 electrostatic units. Secondary anaemias react well to small and medium doses. The best results obtained with thorium X were in rheumatic and other joint affections. Beginning with small doses, he either increased them gradually up to a maximum of about 500 or 600 electrostatic units, or continued the small doses for a considerable time. In small and medium doses thorium X was well tolerated for months. He is not yet able to say whether it is better to administer the substance by intramuscular injections or by the mouth. The dose given by injection was probably more exact, but excellent results were obtained by giving thorium by the mouth. The latter method is cheaper; an injection of 100 electrostatic units costs about 1s., and the corresponding dose by the mouth about 6d. He records the changes produced in the blood, and notes some cases in which certain undesirable effects occurred, but they were rare and not severe. He strongly advises the employment of this substance in anaemia (excepting pernicious anaemia), sciatica, and chronic joint affections.

BRATT'S SYSTEM FOR THE SALE OF ALCOHOL.

For many years Sweden has been Europe's experimental rabbit in the regulation of the sale of alcohol; and a notable example of Sweden's pioneer work is the Gothenburg system. But this, as was pointed out in the Journal of December 7th, 1912, has in many respects proved a failure; and the demand for total prohibition has lately gained favour with a large section of the public. This attitude was endorsed a few months ago in a speech by the head of the Government, and victory for the prohibitionists seemed imminent. Side by side with the agitation for prohibition, there has been a powerful movement in favour of radical changes in the control of alcohol, aiming at restriction of its sale to all, and a total prohibition of its sale to those whose abuse of alcohol has become notorious. The committee appointed in 1908 by the Swedish Medical Society, and subsidized by the State, published in 1912 a long report, and outlined a scheme, the principal features of which were: elimination of private interests in the sale of alcohol, restriction of its sale for consumption at home, and the adoption of stringent measures against the notorious drunkard. Dr. Ivan Bratt, a member of the Committee, has lately elaborated a system which has already been adopted in certain districts in Sweden. This Autumn the authorities in Stockholm have accepted Bratt's system, which is sufficiently elastic to allow of adaptation to the needs of different localities. The principles of this system, which retains certain features of the Gothenburg system, are: the limitation of the quantity of of alcohol sold to each person, and the restriction of its sale to the possessors of tickets of sobriety. These tickets, for which application must be made to the authorities, are denied to persons living outside the district in which the liquor is sold, to habitual drunkards, and to those who have undergone treatment for drunkenness. Tickets are also denied to those who, within the year, have been punished for drunkenness or vagrancy, or have received on their own account, or on behalf of their relatives, poor relief which has not subsequently been refunded. Persons who are violent at home under the influence of alcohol, and others of whom complaints have been made by responsible authorities may also be denied a ticket. Any one who lends his ticket to another, or uses another's ticket, forfeits for ever his right to a ticket.

[1] *Berl. klin. Woch.*, September 8th, 1913.
[2] *Muench. med. Woch.*, September 23rd, 1913.

The ticket must be presented before liquor can be bought, and a record is kept showing the cause and the date of confiscation of a ticket. The sale of liquor for consumption off the premises is limited to persons living in the same area as that in which the liquor is sold, and the amount bought must be entered in a special form supplied by the authorities. So much for the chief features of Bratt's system, which, though accepted by the authorities in Stockholm, has not yet been carried into effect. In localities where the scheme has advanced further various modifications, not involving the principles of the system, have been introduced. Thus in Södertelje, near Stockholm, by a unanimous vote of a commission appointed to frame regulations for the sale of alcohol under Bratt's system, detailed and stringent measures have been decided on. The sale of liquors on the premises is to be confined to the hours 10 to 4 on week days. The premises are to be closed on holidays, between Christmas and New Year, and are to be open two hours less than usual on the days before and after Sundays. No one is to be permitted to buy more than 1 litre of brandy or similar intoxicant in a week, or more than 10 litres in three months. Under special conditions these quantities may be exceeded, provided certain forms are observed. Not more than two "drams" and a bottle of beer may be bought by the same person during the day, nor more than one "dram" and half a bottle of beer within two hours. The Gothenburg principle of serving liquors only with food is to be retained. With certain reservations, the sale of alcohol at hotels and restaurants is to be prohibited between the hours of 11 p.m. and 9 a.m. It is not yet clear to what extent Bratt's system will be adopted in Sweden, but with the prospect of total prohibition as an alternative it is probable that many who would otherwise oppose it will do their best to render it practicable.

CREMATION IN AMERICA.

THE first national convention of American cremationists was held at the crematorium, Detroit, Michigan, on August 27th and 28th. The object of the meeting was to found a national association. Dr. Hugo Erichsen occupied the chair. The following organizations were represented by delegates: The Massachusetts Cremation Society, the Cincinnati Cremation Society, the Buffalo Cremation Company, the Missouri Crematory Association, the Pittsburgh Crematory, the Indianapolis Crematorium, the Forest Lawn Crematorium (Omaha), the Cleveland Cremation Company, the Montreal (Canada) Crematorium, the Lindenwood Crematorium (Fort Wayne, Ind.), the Los Angeles Crematorium, and the Michigan Cremation Association. The following organizations were represented by proxy: The California Crematorium, Oakland; the East Lawn Crematorium, Sacramento, California; the New Haven (Connecticut) Cremation Society. Pledges of support had been sent by the Oakland Cremation Association, of Oakland, California; the Denver Crematory; and the Portland, Oregon, Cremation Association. In an address read by the Chairman, Mr. Oscar B. Marx, Mayor of Detroit, expressed the opinion that cremation was a great sanitary reform that would be increasingly forced upon people by the congestion of cemeteries and of cities. In order to bring about a change in public sentiment a continual propaganda was required, and in this way, he believed, the new national society was destined to play a great part. Cremation throughout the Union had made great progress within the past ten years, but the good work must be continued. Dr. Hugo Erichsen said that this was the first occasion on which those in favour of cremation had assembled to take counsel with each other and to arrange to carry on an effective propaganda. Every cremationist must be a missionary for the cause. That they had the best of the hygienic argument was generally conceded, but some people still contended that earth burial was more beautiful. He read what Mr. Franke W. Dickinson of Springfield, Massachusetts, a past president of the National Funeral Directors' Association, said in addressing the clergymen of that town upon funeral customs. After expressing his conviction that cremation was destined to supersede inhumation, he went on: "Most people assert that sentiment favours earth burial. I am sure that the reverse is true—that sentiment favours cremation, provided that sentiment has for its foundation an intelligent understanding of each. Cremation is a radical change, and its introduction may be slow, but it surely will become general when the people understand, as they will sometime, why it is best." In order to disseminate more thoroughly the arguments in favour of cremation, Dr. Erichsen suggested, first of all, that a lecture, upon which he had expended considerable research and work, should be placed in the hands of the secretary of every cremation society in the United States and in those of individuals in States where there were no cremation organizations. A draft of a constitution and by-laws was submitted to the National Convention, and with certain modifications adopted. It was decided that the name of the organization should be "The Cremation Association of America." The object of the association was defined as "the promotion of the practice of cremation, including the improvement of methods and all matters connected therewith, by expenditure of money from the funds of the society in the propagation of cremation by means of publications, meetings, lectures, or otherwise." The election of officers resulted in the choice of Dr. Hugo Erichsen as president, G. S. Metcalfe as vice-president, Frank L. Cobb as treasurer, and Charles C. Reynolds as secretary.

ACTION AGAINST THE BRITISH MEDICAL ASSOCIATION.

A REPORT of the case Sloman *v.* British Medical Association and others, heard at the Bedford Assizes on October 17th and 18th, containing the terms of settlement, will be found at page 1119.

THE Bradshaw Lecture before the Royal College of Physicians of London will be delivered on November 4th by Dr. T. R. Glynn, Professor of Medicine in the University of Liverpool, who has chosen for his subject Hysteria in Some of Its Aspects. Two Fitz-Patrick Lectures will be delivered on November 6th and 11th by Dr. C. A. Mercier, on Astrology in Medicine. The lectures will be given at the College at 5 p.m.

THE American Medicine Gold Medal for 1913 has been awarded to Dr. M. J. Rosenau, Professor of Preventive Medicine and Hygiene in the University of Harvard. The recipient of this distinction last year was Dr. Gorgas.

THE fifth international congress on provision for the care of the insane will be held at Moscow in January next (8th to 11th). The following is the official programme of discussions: Theories of dementia praecox and degeneration (to be introduced by Drs. A. Bagenoff and A. Marie); out-patient departments for mental diseases (to be introduced by Drs. Carswell and Van Deventer); new methods of treatment in general paralysis (to be opened by Drs. Wagner von Jauregg, Pilcz, and Donath); alcoholic degenerations (to be introduced by Dr. Robinouvitch); cosmic influences in the etiology of certain mental phenomena (to be introduced by Dr. Marie); surgical treatment of certain mental affections (to be introduced by Drs. Delbet, Perriol, and Poussep). The treasurer of the organizing committee is Dr. Bouneieff, Preobrajensky Asylum, Moscow. All communications relating to papers to be read at the congress should be addressed to the Secretary, Dr. Cettline, Krassnoselskaia, 3, Moscow. There will be a psychiatric exhibition in connexion with the congress.

Scotland.

[FROM OUR SPECIAL CORRESPONDENTS.]

MONCRIEFF ARNOTT CHAIR OF CLINICAL MEDICINE.

At a meeting of the Edinburgh University Court, held on October 20th, Dr. William Russell, M.D., F.R.C.P.Edin., was appointed to the new Moncrieff Arnott chair of clinical medicine. Under the new arrangement come to between the University of Edinburgh and the Royal Infirmary, Sir Thomas Fraser was appointed chairman of the medical lecturers. Dr. Russell is at present physician and lecturer on clinical medicine in the Royal Infirmary, Edinburgh, and has been for many years lecturer on the practice of medicine in the Edinburgh School of Medicine, and is Dean of the School of Medicine for Women. Dr. Russell is well known to the profession at large by his writings, chiefly on cardio-vascular diseases. He has taken a keen interest in the work of the British Medical Association, was for a good many years Honorary Secretary of the Edinburgh Branch, and one of its representatives on the Central Council.

THE NEW PROFESSOR OF NATURAL PHILOSOPHY IN EDINBURGH UNIVERSITY.

Professor C. G. Barkla, the new Professor of Natural Philosophy in the University of Edinburgh, gave his inaugural lecture in the M'Ewan Hall on October 16th. Principal Sir William Turner presided, and there was a large gathering of undergraduates, members of the University Court and Senatus, and of the general public. The subject of the address was, "What we Know of Electricity"; and in the course of a lecture which was learned and comprehensive, Professor Barkla gave his views on the mode of action of the x rays in medicine. He had no doubt that the therapeutic effect of these rays was due to their property of causing the body treated to emit electrons, and so produce a state of localized electrification throughout the tissue, millions of small patches becoming momentarily electrified, some positively, some negatively; this state stimulated chemical actions which might be beneficial or otherwise.

NEW ANATOMY ROOMS FOR THE EDINBURGH SCHOOL OF MEDICINE FOR WOMEN.

About seven years ago Minto House, where the Medical College for Women in Edinburgh was partly housed, was sold, and it seemed for a time as if the medical education of women in the city could not be continued. The lecturers, however, found that, with certain alterations and extensions, sufficient room was available in the Surgeons' Hall School of Medicine, and, having obtained from the Court of the University of Edinburgh individual recognition as lecturers and teachers whose courses of instruction entitled women to present themselves for the medical examinations for the university degree in medicine, they continued the teaching of women in the Surgeons' Hall premises under the name of the Edinburgh School of Medicine for Women. There for six years the work has been going steadily on, and the school has already a list of sixty-seven former pupils who took out some or all of their classes there, and who have since graduated as M.B., Ch.B. in the University of Edinburgh, and of nineteen others who have obtained the triple qualification of the Royal Colleges and Royal Faculty of Edinburgh and Glasgow. During these six years the accommodation for the students has been sufficient in all the subjects of medical study save practical anatomy; in this some inconvenience was caused and some crowding suffered by reason of the small space available for teaching purposes. The difficulty thus experienced has now been surmounted; alterations and rearrangement of classrooms have been carried out; and, whilst an improved room has been made for natural history, well lighted and well ventilated dissecting and bone rooms have been provided. The new dissecting-room gives accommodation for six tables. The fact that seventeen new students have joined the school this winter session shows that the increased accommodation has not been supplied too soon.

On October 17th the new rooms were declared open by Principal Sir William Turner, who, along with Professor Rankine, represented the University Court. Dr. William Russell, the Dean of the school, presided, and, after sketching the history of the medical education of women during the past six years, and thanking the University Court for the kindness and encouragement it had given, spoke of the extension of the anatomical department as a distinct forward movement. Another forward step had been the appointment of a woman demonstrator in anatomy, and of a woman demonstrator to assist in both physiology and pathology. They had also to express their sincere gratitude to the Carnegie Trust for its generous approval of the plans they submitted to it, and for its permission to use part of the grant to the school for the structural alterations, which had been carried out under the directions of Mr. Balfour Paul, the architect to the Royal College of Surgeons.

Sir William Turner, in declaring the rooms open, spoke of the professions of nursing and medicine, into both of which women had an entrance; the latter, however, required an education on a higher and much more comprehensive basis. Principles must be mastered as well as details; and, when they got the fundamental ideas upon which they had to work, they would be astonished how much plain sailing there was in their profession.

Dr. Goodall, lecturer on physiology, proposed a vote of thanks to Sir William Turner, and this was cordially given. In addition to a large number of the students of the school, there were present some of the former pupils of the Medical College for Women, including Dr. Beatrice Russell, Dr. Margaret Merry Brotherston, and Dr. Isabella Cameron; Dr. McKenzie Johnston represented the Royal College of Surgeons; and from the lecturing staff of the school were Dr. Whitaker (Anatomy), Dr. William Craig (Materia Medica), and Drs. John Thomson, J. W. Ballantyne, R. A. Fleming, Aitchison Robertson, W. Robertson, and W. T. Ritchie. After the ceremony tea was served in the Royal College of Surgeons.

PREHISTORIC RELICS IN SCOTLAND.

In August last a short cist containing the well-preserved human remains of a brachycephalous man was found in Burgie Lodge Farm, near Forres, by Mr. C. M. Bruce. It was examined by Professor Reid, of Aberdeen, and others, and the general conclusion seems to be that the interment took place from about 4,000 to 5,000 years ago. During the work of removing some stones from the same field Mr. Bruce uncovered another ancient grave about one hundred yards east of the previous find. It is a simply made cist of small capacity, primitive in the extreme, and apparently constructed to receive the ashes after cremation. No trace of bones was found, but only a thin layer of ash containing small particles of charcoal, probably oak. The cist was found about 3 ft. below the surface level, and is egg-shaped but slightly drawn in, the point lying to the east. It measures 24 in. in length, 17 in. at its greatest width, and 12 in. in depth. The floor of the tomb was bordered with small pebbles, and in the centre a flat stone measuring 6 in. by 8 in. No grave goods were in the cist that would associate the find with any age, nor was there any trace of sculpture work, or attempt at dressing the stones. The present is the third ancient grave discovered in this field; the first, found further west in 1848, contained an urn and bead ornaments.

Ireland.

[FROM OUR SPECIAL CORRESPONDENTS.]

DUBLIN HOUSING PROBLEM.

It seems possible that the strike in Dublin may have a least one good effect by compelling attention to the necessity for the adoption of drastic measures to remedy the conditions under which the poor of Dublin are housed. The facts have been again and again set out in these columns, and the report of Sir Charles Cameron, M.O.H., Dublin, for the year 1912, published last week, shows that although improvements have been made since the death-rate of Dublin was 37.8 (in 1880), the conditions which still exist are utterly deplorable. Sir Charles Cameron reports that there are still 21,113 single-room tenements in Dublin; 1,488 of these

are each inhabited by six persons, 854 are inhabited by seven persons, 431 by eight, 146 by nine, 45 by ten, 16 by eleven, and 5 are each inhabited by twelve persons or upwards. The corrected death-rate for the Dublin registration area is 22.3 per 1,000 of the population, and though this is below the average for the last ten years, it compares very unfavourably with the death-rate for the suburbs, which last year was 15.4 per 1,000. On October 17th a deputation appointed by the Association of Municipal Authorities in Ireland waited on Mr. Birrell to advocate State aid for providing houses for the very poor in the various cities and towns of Ireland. The Countess of Aberdeen and Sir Henry Robinson, Vice-President of the Local Government Board, were present. The points put forward by the deputation referred to the necessity for better housing, the extension of the terms for the repayment of loans, with the option to the local authorities as to whether payments should be made by a sinking fund or on the instalment system; and that municipal authorities should have power to acquire compulsorily derelict areas that had not been utilized for a period of five years. The Lord Mayor of Dublin has since announced that Mr. Birrell intends to appoint a small departmental committee to inquire into the character and extent of the problem in Dublin. The Lord Mayor and the Dublin Diocesan Synod have both objected to the character of the inquiry and have urged that a viceregal commission on the whole housing question in Dublin should be appointed. This preference is due to the belief that a private inquiry before a departmental committee would not throw the necessary light on the ownership of the slums.

Epidemic Scarlet Fever in Ulster.

At the meeting of the Poor Law Guardians of Belfast on October 14th it was reported that 172 cases of scarlatina were in the workhouse hospital. The City Fever Hospital at Purdysburn with 270 beds was full, most of the patients being cases of scarlatina. In 1910 the number of cases notified were 734; this was considerably above the normal, or, perhaps more correctly, the ordinary number. In 1911 it was 766, and in 1912 it was 916. This latter figure means that 2.3 per 1,000 of population were attacked; there were 48 deaths, or 5.2 per cent. of those attacked. In the nine months of the present year no fewer than 1,214 persons, or 3.1 per 1,000 of population, have been attacked, with 75 deaths, or 6.1 per cent. of those attacked.

It has been alleged that scarlatina has increased since the opening of the Purdysburn Fever Hospital. This assertion has not been denied, but statistics are not available. It is well known and acknowledged that the most scrupulous care is taken to prevent the spread of the disease from the inmates. The Chairman of the Health Committee (Dr. Thomson) cited Edinburgh, with a larger and equally up-to-date hospital, as suffering from even worse epidemics of the disease. It would be a most important, interesting, and instructive investigation to confirm or refute with actual numbers the statement that is persistently being made that with the latest development of isolation scarlatina increases. Formerly a miserable old fever hospital, the relic of the early days of the nineteenth century, existed in a crowded area in the midst of Belfast, scarlatina was always present, isolation was difficult and inefficient, and yet it was the rarest thing for the disease to be found in the adjoining small streets, or in the general hospital only fifty yards away, though there was a constant traffic between the two. Is there some other factor that has been quite overlooked? The statistics of the Barnardo Home also make us wonder.

There are now 106 scarlatina patients in the Newry Union Hospital, and the clerk of the union has reported that no more can be admitted until further accommodation has been provided. As a temporary measure it has been arranged to use a couple of wards for convalescent patients. The disease is fortunately of a mild type.

A Relieving Officer's Dilemma.

A very curious position of affairs has arisen at Edenderry, and the board of guardians are in a quandary as to their powers in the matter. It appears that when Dr. Mills, of Rhode Dispensary District, went on sick leave some time ago, Dr. Hamilton of Edenderry did the duty for the first four days, and claimed payment of one guinea a day. The Local Government Board wrote pointing out that the usual remuneration for such a period is three guineas; this Dr. Hamilton refused to accept. The relieving officer secured the services of Dr. Small at four guineas a week, but he relinquished the duties after two weeks, and the relieving officer could get no one else to act at the same remuneration. Dr. Hamilton was then appealed to, and consented to resume duty at 30s. a day; but, in view of a recent letter from the Local Government Board to the effect that the relieving officer could not pledge the credit of the guardians in such a matter, the local relieving officer could not appoint him without the definite consent of that body. He placed the full facts before it, and received a reply to the effect that he should make the best terms possible so as to ensure that the district was not left derelict. No communication has reached the guardians in the matter, and, in view of the fact that the Local Government Board has not sanctioned Dr. Hamilton's original claim of one guinea a day, it is doubtful if the present arrangement at a higher rate will be permitted. The situation was discussed at the last meeting of the guardians, and it was pointed out that the relieving officer was bound to see that the district was properly attended to, but without the Local Government Board's sanction he could not offer a special rate of remuneration to a locumtenent. If he failed to have the district medically supervised he would leave himself open to dismissal, whereas if he appointed a medical officer at anything beyond the usual remuneration he would subject the guardians to the danger of a surcharge. The matter was postponed pending the receipt of a letter from the Local Government Board.

University College, Cork.

The report of the president, Sir Bertram Windle, on University College, Cork, is a history of continued progress. The number of students attending during session 1912-13 was 429, and of these 389 were matriculated, 17 non-matriculated, and 23 post-graduate. The number of students is practically the same as last year, but the number of matriculated students has considerably increased. This is the matter of real importance, since the non-matriculated students must necessarily fluctuate considerably in number. Professor Anglin has resigned the chair of mathematics, and Professor Conran has been appointed thereto, and the vacancy thus created has been filled by the appointment of Professor E. Harper, M.A. The opening of the college to dental students has been a great advance. This was rendered possible by the decision of the North Infirmary to open a dental department at which clinical instruction in this subject can be carried out. Two lecturers have been appointed—one in dental surgery, Dr. J. R. Hackett, L.D.S., and one in dental mechanics, Mr. G. Sheedy, L.D.S. The college has been provided for the first time with a proper set of administrative offices, and the council room has been enlarged to meet the requirements of the increased numbers both on the governing body and the academic council. New heating apparatus has been fitted into the main block, and will render the various classrooms and offices more comfortable. During the year the college authorities purchased the D'Arbois de Jubainville Library, an exceedingly valuable collection, numbering some 1,100 volumes of books, relating to the Irish language, folk lore, literature, and history. A very important development has taken place in connexion with the School of Commerce by which students can have six months' training in business houses of repute in the city during the summer months. The number of medical students is still the highest of all the faculties.

Deportation of Pauper Lunatics.

Recently a pauper lunatic, who had resided in Manchester Union, was sent back to the Athy Union, and thence to Carlow Asylum. The Athy guardians protested against this, especially as there is no similar power in Ireland to deport English and Scottish pauper lunatics. Dr. Greene, Resident Medical Superintendent, Carlow Asylum, stated that the committees of management of the Irish asylums had from time to time protested against such deportations, but the Irish asylums suffered more by the deportation of lunatics frem the United States. Quite recently a woman was deported to Carlow from the States; she had lived there for fifteen years, but

had neglected to take out naturalization papers. The Clerk was directed to call the attention of the Irish members of Parliament to the matter.

OVERCROWDING IN MULLINGAR ASYLUM.

At the last meeting of the Joint Committee of Management of the Mullingar District Lunatic Asylum, a discussion took place on the overcrowding of the institution. Dr. Gavin, Resident Medical Superintendent, reported that the number then in the house was 1,026, an increase of 13 on the corresponding period of last year. The Chairman said that in one dormitory there were 100 women who had to live there night and day. There were about 100 to 150 persons in the asylum in excess of the number for which there was accommodation. The increase was at the rate of 15 patients a year. The question of an additional building is to be considered.

EXEMPTIONS FROM VACCINATION.

At a recent meeting the Navan Guardians passed a resolution not to prosecute people making a declaration of conscientious objection to vaccination. At the next meeting the Local Government Board was asked for its opinion, and at the meeting held last week a reply was received stating that under the statute the guardians had no power to grant exemptions from the requirements of the vaccination law.

England and Wales.

[FROM OUR SPECIAL CORRESPONDENTS.]

LONDON.

LONDON COUNTY COUNCIL.

Treatment of Tuberculosis.

A LETTER from the Local Government Board in reply to a request by the London County Council for a statement of the views of the Board with regard to the administration of treatment for tuberculosis in London (BRITISH MEDICAL JOURNAL, August 9th, p. 343) was reported to the Council. The Board, as stated in the JOURNAL of October 11th, p. 963, maintained the opinion previously expressed that the London County Council should be the tuberculosis authority for the metropolis, and that through the County Council all the various agencies should be properly coordinated to form parts of a complete scheme of institutional treatment for this disease. It was essential that the dispensary arrangements should be closely related to the preventive work which it was the duty of the sanitary authority to carry out, and there were many advantages in regarding the metropolitan borough as the unit area for dispensaries. Accordingly the Board had invited the metropolitan borough councils to provide, or arrange for the provision of, these institutions. The Board agreed with the view contained in the resolution of the County Council that all possible use should be made of existing institutions; in the Board's opinion any hospitals or other voluntary institutions which were to be recognized as forming part of the tuberculosis scheme for London should be willing to work in close co-operation with the local authority. The Board agreed with the County Council in thinking that as far as practicable arrangements should be made for referring any specially difficult cases from a municipal or voluntary dispensary to some general or special hospital. The Board called attention to the recommendation of the Departmental Committee that each area should have a chief clinical tuberculosis officer, who should also act as medical adviser to the Insurance Committee of that area. This officer might also, in consultation with the other medical men concerned, supervise and generally direct the selection of cases to receive residential treatment. It seemed to the Board desirable that the cost of the scheme, at any rate to a large extent, should be borne by London as a whole. Inasmuch, however, as the dispensaries were to be provided locally, some proportion of the cost of providing these institutions should be charged locally. It would simplify matters if, as regards the treatment of insured persons, the County Council were recognized as the providing authority for all the institutional treatment required, whether in dispensaries or other institutions, so that the London Insurance Committee could make one agreement with the London County Council in regard to all the services rendered to insured persons. The Board stated that it would be happy to arrange, if desired, for a further conference with representatives of the County Council.

In some observations on the letter the Public Health Committee remarked that during the time the Council had been engaged in the preparation of a comprehensive scheme the Local Government Board had, without reference to the Council, approved local schemes prepared by the local sanitary authorities for the provision of dispensary treatment. It had thus been rendered very difficult, if not impossible, for the Council to organize a comprehensive scheme for London. In order, however, to avoid further confusion and inequality of treatment, the Committee thought the Council should agree, so far as dispensary treatment was concerned, to act to some extent on the lines suggested by the Board. All local schemes should be submitted to the Council in the first instance, and, so far as uninsured persons were concerned, contributions in relief of local rates, subject to certain safeguards, should be made out of the county fund. If the Council disapproved of a local scheme and the local authority concerned refused to make amendments to meet the Council's objections, the Committee thought that the Council should make no contribution. The Committee was unable at this stage to put forward even an approximate estimate of the expenditure which would fall upon the county rate if the proposal were adopted. From details available of the estimated cost of certain local schemes, the annual charge on the county rate might amount to upwards of £10,000. The Committee recommended the Council to pass the following resolution:

> That any comprehensive scheme for dealing with the treatment of tuberculosis in London shall provide for a contribution being made by the Council, from year to year, towards so much of the cost of the dispensary treatment of uninsured persons in the City of London and each metropolitan borough as would otherwise fall on the local rate, after taking into account the promised grant from the imperial exchequer, provided that such contribution (1) shall not exceed 50 per cent. of such cost; (2) shall in the first instance be made from a date to be fixed hereafter by the Council; and (3) shall be conditional upon the Council being satisfied with the local scheme in force in such area, and to the arrangements and expenditure being annually submitted to and approved by the Council.

Consideration of the subject was postponed.

Power to License Lying-in Homes.

The Midwives Act Committee presented a further report as to the proposed legislation for licensing lying-in homes.[1] The Committee stated that it did not appear necessary or desirable that the Council's powers of licensing should extend to Poor Law institutions or important hospitals or to a private residence in which a relative of the occupier was received for her confinement. Such places should be excepted from the proposed legislation. It was necessary, also, having regard to the variety of institutions and places concerned, that the Council should retain the right to make certain other exceptions. There was still in force an Act of George III which required certain lying-in institutions to be licensed by the justices in quarter sessions. This Act was practically obsolete, and it might be found necesary to repeal or amend it. In the event of the Council obtaining the power now sought, the additional cost involved, in the first instance at any rate, would be small, and the appointment of one female inspector at a salary of about £100 a year would probably be sufficient.

The Council decided to promote legislation on the lines indicated above, a clause being added to provide for an appeal to a police-court magistrate in case of the refusal of a license by the Council.

Massage Establishments.

On the report of the Public Control Committee recommending the Council to promote legislation in 1914 dealing with the control of nursing homes and establishments where massage, manicure, or electric treatment is carried on (BRITISH MEDICAL JOURNAL, August 9th, p. 343), Mr. Parsons moved an amendment to exclude from the operation of the proposals "recognized hospitals defined by schedule or otherwise," and to include premises where treatment by light, electricity, or baths, or other similar

[1] BRITISH MEDICAL JOURNAL, August 9th, p. 343.

treatment was carried on. Wide powers were, he said, necessary, because already, since the Council's proposals were first published, premises which had come under the notice of the police were being advertised as schools of instruction in foreign languages. Establishments at which the present proposals were aimed might possibly be better dealt with by the police, or by the borough councils, which were charged at present with the duty of suppressing disorderly houses. Lady St. Helier having seconded the amendment, the Chairman of the Committee said that the reason it was not proposed that the police should deal with this matter was that there was much stronger objection amongst the public generally to police than to Council inspection. He accepted the amendment, and the recommendation as amended was then agreed to.

Medical Inspection of Schools.

A summary of the annual report of the county medical officer of health and school medical officer for London for the year 1912 was presented to the Education Committee of the London County Council on October 22nd. The decision of the Council that the whole of the school medical work, including the organization and administration of medical inspection and treatment, should be placed under the direction of the medical officer of health for the county, took effect from January 1st, 1912, and the report dealt with the work of the school medical service for a complete year under the new administration. Of 240,764 children examined in detail at ordinary inspections, 85,508 were referred for treatment for various defects. In addition, 10,616 children were specially examined, and of these 6,816 were referred for treatment. At the end of the year provision was made for the treatment at 11 hospitals and 17 centres of 73,058 children for diseases of the eye, ear, nose, and throat, ringworm, dental caries, and minor ailments. There was no marked prevalence of scarlet fever, and the number of cases of diphtheria (2,571) was practically the same as in 1911. The report contained notes on the behaviour of infectious diseases in certain schools, and it was suggested that the subject of the association of scarlet fever and diphtheria was deserving of further study. The incidence of measles, which showed a diminished prevalence as compared with 1911, was discussed in some detail. Two open-air schools were open throughout the year, with very good results, and eighty-five playground classes had been carried on during the summer. The cleansing and personal hygiene schemes had been considerably developed, 630,369 examinations were made, or two-and-a-half times as many as in 1911, and 23,573 children were reported verminous. The total number of examinations made in schools for defective children was 14,652, and the report contained an analysis of the previous and family history of 3,000 mentally defective children. The full report will shortly be issued, and will receive more detailed notice in the JOURNAL.

Medical Treatment of School Children.

It was reported to the London County Council on October 21st that the Board of Education had approved as generally satisfactory the revised arrangements for the medical treatment of school children made by the Council before the summer recess (BRITISH MEDICAL JOURNAL, July 5th, p. 42). The Board, however, suggested that, with a view to placing the work of the centres more definitely under the general supervision of the school medical officer, Clause 1 in the agreement with committees of medical practitioners should be modified as follows:

> The administrative control of the centre, including the arrangements for supplying the centre with patients and for following up cases after treatment, shall be vested in the Council, and the work of the centre shall be under the general supervision of the Council's school medical officer.

The Education Committee did not anticipate that the committees of the centres would raise any objection to the modification suggested, and was of opinion that the alteration should be made. The Council approved the proposal.

METROPOLITAN ASYLUMS BOARD.

Salaries of Assistant Medical Officers.

The Metropolitan Asylums Board on October 18th considered proposals in connexion with the salaries assigned to assistant medical officers in the asylums service. The Asylums and Finance Committees mentioned the difficulty which for some time past had been experienced in obtaining assistant medical officers. This experience was not confined to the Board, but was general throughout the country, and was due in part to fewer entries at the medical schools, and, to a greater extent, to recent legislation, which had opened out to medical men a wider field of official employment. While there had been a general increase in the salaries offered to assistant medical officers in asylums throughout London and the country, the Board's rates of remuneration compared unfavourably with those prevailing in the London County Council and home counties asylums. It was proposed that the scale of remuneration of these officers should be increased. The rates paid at present and the revised rates suggested are as follows:

Present Scale.—Senior assistant medical officer: Commencing salary £250 a year, rising by annual increment of £10 to £300. Second assistant medical officer: Commencing salary £180, rising by annual increment of £10 to £200. Third and fourth assistant medical officers: Commencing salary £150, rising by annual increment of £10 to £170.

Proposed Scale.—Senior assistant medical officer: Commencing salary £300 a year, rising by annual increment of £15 to £360. Second assistant medical officer: Commencing salary £210, rising by annual increment of £10 to £250. Third and fourth assistant medical officers: Commencing salary £180, rising by annual increment of £10 to £200.

The Finance Committee concurred in the proposals on the understanding that the increased remuneration would cover any extra services that might be rendered under the National Insurance Acts (services which were light and, in the asylums, would be a diminishing quantity). The Board decided to give formal notice under its Standing Orders of its intention to make the increases in the scale of remuneration.

Position and Salary of the Medical Officer for General Purposes.

The General Purposes Committee reported that it had received an application from Dr. H. E. Cuff, the Medical Officer for General Purposes, for a reconsideration of his position and the salary attached thereto.

Dr. Cuff was appointed under the designation of Medical Officer for General Purposes in February, 1908, and since that date had been remunerated at the rate of £850 per annum. Over five years having now elapsed the Committee thought it desirable to review Dr. Cuff's position on the Board's staff, and the duties and responsibitities attached to his position. There could be no doubt that these had materially increased since the appointment was made. Dr. Cuff now took part in every branch of the Board's work, and was called upon to advise upon reports and requests received from all sources, including those from outside authorities as well as those made to committees and subcommittees of the Board. His work covered important questions of institution administration, of arrangements of accommodation, and of treatment of diseases, including those dealt with by the Board and those which it was suggested should be received for treatment. The Committee was of opinion that the position which Dr. Cuff, in fact, occupied of principal medical adviser to the Board was very indistinctly recognized by his existing title, and that it would be in the Board's interest to attach to the post a designation which would strengthen Dr. Cuff's position and attach more significance and weight to his reports, many of which the Board found it desirable to issue to other bodies. The title Principal Medical Officer should, therefore, be used in future.

With regard to the remuneration, the Committee was satisfied that considerable economies had been effected as a consequence of Dr. Cuff's advice and reports, especially in such matters as dietary of patients and purchase of goods, and this, coupled with the increase in work referred to, justified some addition to the present salary. The Committee suggested an increment of £50 per annum, and pointed out that even with this the post would not be so remunerative as that of many of the medical superintendents, who had the opportunity of adding to their incomes by students' fees.

The Committee recommended that, subject to the sanction of the Local Government Board, the title of Medical Officer for General Purposes be altered to that of Principal Medical Officer, and that the remuneration attached to the post be increased from £850 to £900 per annum.

This was agreed to.

A MOTHERS' HOSPITAL.

The lying-in hospital for women of the poorer classes which has been carried on for some years past by the Women's Social Work Section of the Salvation Army in Mare Street, Hackney, has been transferred to larger premises in the Lower Clapton Road, which were formally opened by Princess Louise, Duchess of Argyll, on October 18th.

The new buildings, which will be known in future as the Mothers' Hospital, provide accommodation for 50 women, and consist, in addition to the necessary offices, reception rooms, nurses' and pupil midwives' quarters, of four beautifully appointed bungalows, each containing four wards, connected with the main buildings and with each other by a covered colonnade. These bungalows are so arranged that their inmates are always under the immediate observation of the nurse, whilst their number makes it possible, to a certain extent, to classify the patients. At present it is proposed to use one bungalow for the unmarried and one for the married mothers; another is set aside for special cases, and the fourth is to be reserved for Jewish women. An isolation ward has also been erected in a corner of the grounds. Mrs. Bramwell Booth, who received the Princess, said that the present buildings were incomplete, and that it was hoped that in course of time sufficient funds would be collected to provide accommodation for 150 patients. For this a sum of £50,000 was needed; the new buildings have cost £27,000, of which £22,000 has already been subscribed. The opening ceremony was then performed by the Princess, and a short service having been held, the wards were thrown open for the inspection of the numerous visitors who had assisted at the afternoon's function.

BIRMINGHAM.

Hospital Saturday Fund.

The total of this year's collections for the Hospital Saturday Fund amounted to £22,108, but there are still a number of contributions outstanding. In view of the exceptional difficulties of the year—misunderstandings and unsettlement caused by the National Insurance Act and the protracted strikes in several directions—the committee regards the result as highly satisfactory, as the total is not very far short of the previous year's amount. The misconceptions with regard to the Insurance Act accounted for upwards of 150 firms discontinuing the collection, at least temporarily, but, on the true position being explained to them, in the majority of cases the firms came to see that they would be making a great mistake in giving up the Hospital Saturday collection. The volume of work done at the convalescent homes at Droitwich and in other directions has already established another record. At the Sir William Cook Memorial Home for Consumptives at Romsley Hill there are at present 60 male patients, and the treatment of 40 female patients at the same institution is just being commenced. The sum of £10,000 has been distributed among the hospitals and nursing societies of the city on account of the free work done by them. The institutions which have received the largest amounts are: General Hospital, £3,150; Queen's Hospital, £2,100; General Dispensary, £1,010; Children's Hospital, £800; Women's Hospital, £500; Jaffray Branch Hospital, £400; Eye Hospital, £350; Orthopaedic Hospital, £300; Lying-in Charity, Homoeopathic Hospital, Skin and Urinary Hospital, and Moseley Hall Convalescent Home for Children, £200 each.

Rebuilding of the Orthopaedic Hospital.

The general committee of the Royal Orthopaedic and Spinal Hospital, Birmingham, has intimitated in its annual report that the time has now arrived when the rebuilding of the hospital should be undertaken. The provisional scheme provides for the erection of a suitable building upon the present site, its equipment, an increase in the number of beds from 30 to 50, and the repayment of the mortgage debt on the out-patient department of £2,800. The cost is estimated at about £30,000. The treatment of orthopaedic cases now involves the performance of many operations, in which the most rigid asepsis is absolutely essential, and a building of the age and character of the present in-patient department is unsuited to the efficient performance of such work. The treatment of surgical tuberculosis, which forms a large proportion of the work of the hospital, requires a building with a more modern system of ventilation and lighting. The number of patients treated has scarcely been affected by the operation of the Insurance Act.

LIVERPOOL.

Opening of the Medical Session.

The number of students entered at the medical school this year constitutes a record, and is an increase of fully 20 per cent. on former numbers. Each year sees fresh developments in the amenities of student life at the Liverpool University. The beginning of the present session is marked by the opening of the Students' Union (Gilmour Hall), an institution which is destined to play an important part in bringing together the students of the different faculties and creating that *milieu* which is one of the most important factors in university life and education, though unmentioned in this curriculum.

A new chair—the Walter Myers Chair of Parasitology—has just been founded, and an appointment will shortly be made.

The Medical Institution.

At a meeting on October 16th, Mr. Robert Jones in a presidential address, described the views held by the late Mr. H. O. Thomas, more especially on intestinal obstruction. His splints were familar to all, but, partly owing to his writings having been published privately, his work in other directions was too little known. Writing in 1884, he recognized the futility of the commonly advocated methods of treating intestinal obstruction—namely, by purgation enemata and milk diet. He saw that where a mechanical condition was the obstruction, no medical treatment could avail anything, but that in cases of functional obstruction it was possible by resting the bowel, by rendering the contents above the block fluid and non-irritating, and by relieving pain, to give a favourable termination to many cases. The treatment he advised was first to relieve pain by hypodermic injections of morphine, to allay thirst by the administration of water, and to withhold all food that would add to the contents of the intestine. Cases so treated might go on for from forty to fifty days. Resolution occurred by the patient passing first flatus, perhaps some small scybala, then a large pultaceous motion followed by watery evacuations. Mr. Thomas was particularly anxious for his cases at this stage, enforcing complete rest and allowing food to be given only very gradually and of such a kind as to produce as little intestinal residue as possible. The speaker also alluded to the views of Ochsner of Chicago, who had recommended lavage starvation, while he withheld cathartics.

WALES.

Red Cross Work at Senghenydd.

The work of the Red Cross detachments in connexion with the Senghenydd Colliery disaster has won unstinted praise from all who have witnessed it. The Senghenydd Voluntary Aid Detachment was on duty within a very short time of the explosion, and other detachments from the neighbourhood quickly came to their assistance. A temporary hospital was organized under the direction of Dr. Ivor Davies, where first aid was given, and from which the men most severely burnt were transferred by special trains to the Cardiff Infirmary.

Dr. Dan Thomas, of the Bargoed Red Cross Brigade, was the medical man with a party which went down the pit on Wednesday, October 15th, and succeeded in bringing up eighteen men alive; the work of this party was very difficult and dangerous.

At a later date a party of Red Cross men with stretchers went down the pit with Colonel Pearson, senior Government Inspector of Mines, but the greater part of the Red Cross work was done at the surface in the temporary hospital and in the convoying of patients to their homes or to the Cardiff Infirmary.

The danger of the work in the pit is well shown by the fact that as late as October 21st an advance party of the repair gang were in serious danger from gas poisoning. One of the party carried a canary which it was expected would give a warning, but before any signs of distress were noticed in the bird several of the party were overcome. With the assistance of the Aberavon rescue brigade wearing the Draegar apparatus, the party was rescued. The men were treated in the temporary hospital, where all recovered.

Correspondence.

SPECIAL HOSPITALS.

SIR,—The publication of my presidential address (Section of Ophthalmology, Annual Meeting, Brighton), an editorial in the BRITISH MEDICAL JOURNAL on it, and editorial comments thereon appearing in the *Liverpool Daily Post*, have disturbed the equanimity of the staff of the Liverpool Eye and Ear Infirmary.

The address was a simple historical sketch of the development of ophthalmology in Great Britain, from chaos at the beginning of the nineteenth century, to its emancipation in 1878 from the thraldom of the general surgeon; the official recognition of it as a special science in 1879 by the formation of a separate Section of Ophthalmology; and the founding, in 1880, of the Ophthalmological Society of the United Kingdom. The sketch, showing how great is the debt ophthalmology owes to the British Medical Association, left the subject as it stood in 1880, and, as I was not writing a history of the practice of ophthalmology, consideration of eye and ear hospitals had no place in my thoughts.

The *principle* that ophthalmology was a distinct department of medical and surgical science being established, and the seal of professional approval thus placed on the founders of ophthalmic hospitals, any consideration of its progress must inevitably include them in a review of its practice. Editorial comment in this direction is clear and definite. We read:[1]

> The opposition [of the staffs of the general hospitals] led to the foundation of special hospitals, and financial considerations sometimes impelled the founders to associate the treatment of diseases of the ear with those of the eye, a combination which placed a serious impediment in the way of the growth of either.

The *Liverpool Daily Post and Mercury*, being a great newspaper, and ever alive to the needs of our city, accepted the dictum of the BRITISH MEDICAL JOURNAL, and applied it in a short editorial to the practice of the Liverpool Eye and Ear Infirmary, in the following terms:

> We in Liverpool seem to have been fond of double harness surgery, as is illustrated by our eye and ear hospital, and our skin and cancer hospital, in which a union of incompatibles has been attempted, with ill results to science and practice.

The editor of the *Daily Post and Mercury* gave to me the credit of desiring to dissolve, if possible, this union. In so far as my address was concerned, I cannot claim the compliment, for it was not written as a means to that end. But the question of special hospitals might well provide the theme for the next presidential address. My views on the subject have for the last thirty years been openly expressed—namely, that a special hindrance to the progress of ophthalmology and otology in Liverpool has been the existence of the Liverpool Eye and Ear Infirmary. Where advance has been made in either of these specialties it has been due to the initiative of individuals, and in spite of the Liverpool Eye and Ear Infirmary. If this controversy should terminate in the complete severance of eye and ear in hospital practice, it will be to the unqualified advantage of the citizens of Liverpool and of the medical profession.

As I have the progress of ophthalmology at heart, and would like to see Liverpool take a leading position in this special department of medical education, I willingly join issue as to the policy and practice of the Liverpool Eye and Ear Infirmary.

The point between us is simple: Are the statements (*a*) that "financial considerations sometimes impelled the founders—of special hospitals—to associate the treatment of diseases of the ear with those of the eye," and (*b*) that it was "a combination which placed a serious impediment in the way of the growth of either," correct and just statements? I believe they are wholly correct and just, and that the history of the Liverpool Eye and Ear Infirmary proves the contention.

The case for the staff of the Eye and Ear Infirmary has been stated in the columns of the *Daily Post and Mercury* by "F.R.C.S.", and by Mr. Hugh E. Jones[2] and Mr. Edgar Stevenson[3] in the JOURNAL.

[1] BRITISH MEDICAL JOURNAL, vol. ii, 1913, p. 266.
[2] BRITISH MEDICAL JOURNAL, vol. ii, 1913, p. 520.
[3] BRITISH MEDICAL JOURNAL, vol. ii, 1913, p. 772.

Your readers would, however, be deprived of a literary treat, and the future historian of a valuable piece of evidence, if the letter originating the correspondence was not also enshrined in the pages of the JOURNAL, and I crave space for its insertion. After perusal, no one will be surprised that the editor of the *Daily Post and Mercury* decided that further correspondence must be under medical supervision. The letter is as follows:

INCOMPATIBLES.

To the Editor of the *Daily Post and Mercury*.

Sir,—A leader under the above heading appeared in your issue for Monday, August 4th, and as one of those interested in the "incompatibles" you and Mr. Bickerton complain of, I should be obliged if you would allow me some space to answer it. In your leader you say that the association of diseases of the eye and ear in hospitals has been "to the considerable disadvantage of both," and further on, "they have no connexion—physiological, anatomical, or pathological."

On the first of these statements Mr. Bickerton has no right to speak, as I believe I am right when I say he is purely ophthalmic surgeon to the Royal Infirmary, and knows little, if anything, concerning the advantages or disadvantages of a combined hospital.

In regard to the second statement, it is merely ridiculous, as it has been proved that the eye and the ear are in communication through the tracts of the brain. These tracts are well known, and the knowledge of them completely upsets the "anatomical or physiological" part of your sentence.

Then as to the pathological connexion. There are hundreds of cases of eye disease which are undoubtedly due to disease of the ears; and, again, there are hundreds of diseases of the ear, or their complications—for example, cerebral abscess, labyrinthine disease, etc.—which it is impossible to diagnose accurately without an examination of the eyes, and it must be remembered that the complications of ear disease are the critical cases of aural surgery.

If any aural or ophthalmic surgeon attempted to act upon your statement, it would indeed be hard on the patients, as there would be many cases undiagnosed, and many deaths due to this lack of diagnosis. It is impossible for any aural surgeon to be first-rate in his work without a minute knowledge of diseases of the eye, and vice versa, and it is to the direct benefit of the patient to have a surgeon who is not such a "pure" specialist that he will miss a diagnosis which he could make with certainty by reference to the other of the two—ear and eye—when treating the one.

I know nothing about cancer or diseases of the skin, but should imagine they are connected in much the same way.—Yours, etc.,

F.R.C.S.

[The statements on which we commented were published by the BRITISH MEDICAL JOURNAL, which would be a more suitable medium for controversy on such a subject than our columns.—Ed. *D.P. and M.*]

The Honorary Secretary of the Liverpool Eye and Ear Infirmary not long since wrote of "gentlemen who prefer to hide their identity under *noms-de-plume*, and who then are sufficiently brave to make all sorts of insinuations without taking the trouble to make themselves acquainted with the facts." Perhaps "F.R.C.S." will bear that fact in mind before he again writes anonymously.

In his anxiety to defend "double-harness surgery," "F.R.C.S." in effect brings an indictment of culpable negligence (wholesale murder) against those responsible for the establishment of purely ophthalmic hospitals. The London public must be in sore straits, for there is not one single "eye and ear" hospital to be found in the metropolis. A recital of facts gives the *coup de grâce* to the fictions of "F.R.C.S."

1. The Royal London Ophthalmic Hospital, suggested October 1st, 1804, as the "London Dispensary for Curing Diseases of the Eye and Ear," was opened March 25th, 1805. It was the first special hospital established in England. Ear work was discontinued in January, 1808. Will "F.R.C.S." tell us why?

2. Fifteen hospitals for the exclusive treatment of diseases of the eye—excluding the Royal London Ophthalmic Hospital—were established in Great Britain between 1804 and 1832—namely, in London, Exeter, Bristol, Bath, Manchester, Liverpool, Plymouth, Norwich, Newcastle, Edinburgh, Birmingham, Glasgow, Brighton. To-day there are twenty-eight such special hospitals in Great Britain. In London there are five large special eye hospitals, accommodating 259 beds and 2 cots, but no mention is made in the pages of the *Medical Directory* of the existence in London of any hybrid hospital of the eye and ear type. An ear hospital is mentioned—founded in 1816; likewise a throat hospital—founded 1863; and five hospitals devoted to ear, nose, and throat—the earliest

founded 1838. Can "F.R.C.S." give an instance from the "hundreds of cases of eye disease due to disease of the ear," in which death due to lack of diagnosis—for want of an aurist—took place in any of the above hospitals; and can he get an ophthalmic or aural surgeon to endorse his statement?

The only eye hospital among these pioneer institutions of ophthalmology which has altered its title and practice is the one originally bearing the honoured name of the Liverpool Ophthalmic Hospital. John Gladstone, M.P.—father of the "Grand Old Man"—presided at its institution in 1820. Nineteen years later—1839—a member of the staff started a private "Institution for Diseases of the Ear," which he tendered to the town for adoption in 1840, and in 1841 advocated and secured its union with the Ophthalmic Hospital. The general arguments advanced for amalgamation were that "a multiplication of charitable institutions was an evil instead of a good, that it created a great expenditure of money which might be applied to more beneficial purposes," and two special arguments from the treasurer of the Ear Institution were "that if this institution were amalgamated with the Ophthalmic the greater part of its expenses would be saved to the public, and a great deal of valuable time to the gentlemen who formed the committee." These arguments sufficed, and the Liverpool Ophthalmic Hospital became the Liverpool Eye and Ear Infirmary, January 18th, 1841.

Not one word is to be found in the report of the meeting as to any professional advantage likely to accrue to patients through the amalgamation. The utmost the founder of the Ear Institution, who was also a staff surgeon to the Ophthalmic Hospital, could say was: "I think it may work as well for the public good in connexion with the Ophthalmic Infirmary as *it did alone*."

The specified advantages urged for the amalgamation are beyond controversy. They were of a commercial character: (1) Saving of expense to the public, (2) economy of the valuable time of the committee—probably also that of the professional gentleman attached to both institutions, though this is not stated. The history of the union of the Institution for Curing Diseases of the Ear with the Liverpool Ophthalmic Hospital is convincing proof of the editorial contention that "financial considerations sometimes impelled the founders to associate the treatment of diseases of the ear with those of the eye."

Mr. Hugh E. Jones's arguments are contradictory. He is "a strong advocate" for "double harness," but he has "never defended the practice of compelling one man to do work of different kinds." Is such compulsion the policy of the Eye and Ear Infirmary? He says the Infirmary "has been staffed for the last twenty-five or thirty years by pure specialists" . . . "some of whom nearly or entirely confined themselves to eye work." If this be a correct statement, who did the ear work? Will he name the pure specialists who "entirely confined themselves to eye work" during the last twenty-five or thirty years? I have known of but one member of the staff who developed into a "pure" specialist. I refer to the late Mr. George Stone, and he ceased to be connected with the Infirmary owing to the action of the committee, acquiesced in by the staff. If Mr. Jones had said certain members of the staff became sick of ear work *at the Infirmary*, and whenever possible passed it over to the junior members, his statement would be literally correct. The dispenser syringed the ears of the patients, to my knowledge, in 1881, 1882, 1883, and 1884.

Mr. Hugh E. Jones's letter is in its way a remarkable contribution. Ignoring the editorial comment in the BRITISH MEDICAL JOURNAL, that "to associate the treatment of diseases of the ear with those of the eye" was "a combination which placed a serious impediment in the way of the growth of either," he takes exception to the *Daily Post* accepting and commenting on that view, not on the ground that the statement was wrong, but because publication of it "was by implication a grave injustice to the Liverpool Eye and Ear Infirmary, and is calculated to lower that hospital in the eyes of the profession and public."

It is still more remarkable in that he himself advocates separation of the two specialties. Either the *Daily Post* contention is right or it is wrong. Mr. Jones is either wrong in condemning the *Daily Post* or he is wrong in hoping "that eventually a complete and separate staff of surgeons will be provided for each department." Mr. Jones's statement implying that the combination of the eye and ear is kept up because some of the staff, "from love of the work, long training, and the character of their private practice, find it impossible to relinquish either of the two specialties," seems tantamount to sacrificing the interests of the hospital to the exigencies of private practice.

Mr. Jones's would-be witty allusions to "bare oculists" and "bare aurists" are inconsequent. The term "bare oculist" is, historically, applicable only to a period and condition of medical education existing nearly a century ago, while on the other hand the term "bare aurist" is a creation of Mr. Jones.

If by it he distinguishes an individual attached to an ear and eye institution upon whom there is no obligation—by rule—to know ear work, but who is willing to do his best for patients suffering from ear diseases, then every member of the staff of the Liverpool Eye and Ear Infirmary is a bare aurist, and one bare fact will demonstrate this. When the "ear" was tagged on to the Liverpool Ophthalmic Hospital, neither the committee nor staff of that day—nor succeeding days—considered previous study of the ear a necessary qualification for appointment at their institution. The following rules applicable to appointment of surgeons and assistant surgeons at the Liverpool Eye and Ear Infirmary, are taken from the annual report for the year 1912, published in 1913:

Surgeons.

3. No gentleman is eligible to the office of surgeon who is not a doubly qualified practitioner, and who has not attended some ophthalmic institution for six months.

Assistant Surgeons.

1. No gentleman is eligible to the office of assistant surgeon who has not a registered double qualification, and who has not held an appointment in a recognized ophthalmic institution for six months.

It may be concluded that to have required some knowledge of the ear from applicants for appointments would have hampered the committee in their selection, and that they preferred to exercise their discretion as to adaptability of candidates. It should also be remembered that the medical men of that day had before them the experience of the Royal London Ophthalmic Hospital in discontinuing ear work, and they cannot have been unaware of the establishment of the Royal Ear Hospital in 1816.

Lord Beaconsfield once said, "It is much easier to be critical than correct." Mr. Hugh E. Jones draws on his imagination for his facts in stating that "Mr. Bickerton . . . honours the Liverpool Eye and Ear Infirmary by sending his specimens to the laboratory of that maligned institution to be cut, mounted, and examined, showing that he, at any rate, appreciates the value of the work done there." I have not sent any specimen to the laboratory of the Eye and Ear Infirmary. I send my specimens to Dr. Harcourt, the demonstrator of ophthalmic pathology to the Liverpool University, and I pay him for all work done for me. As Dr. Harcourt honours the Liverpool Eye and Ear Infirmary by being pathologist to it, Mr. Jones will have no difficulty in verifying my statement. I appreciate Dr. Harcourt's work so highly that should the Liverpool Eye and Ear Infirmary ever dispense with his services, my work will still be entrusted to him. The extinction of the Eye and Ear Infirmary to-morrow could not affect my practice in this respect. The Eye and Ear Laboratory Mr. Jones speaks of only came into existence in 1901, whereas my pathological specimens date from 1880.

Mr. Edgar Stevenson's letter deploring the temperate language used by Mr. Hugh E. Jones may be dismissed. It is pleasing to know that he and his colleagues are interested, and his suggestion that the policy of the *Daily Post and Mercury* is dictated by me is as flattering as it is ridiculous, and will be appreciated in the proper quarter.

That the Eye and Ear Infirmary has barred the way to progress in the sciences of ophthalmology and otology in Liverpool the following facts testify:

1. Candidates for appointments are required by the committee to attend to cases of both eye and ear disease, *though there is no rule to that effect in the general laws of*

the institution, nor any mention of training in otology, or even attendance at an ear hospital, being necessary. The following correspondence places this beyond controversy. The writer is now an ophthalmic surgeon in London.

Dear Sir,—As it is my present intention to devote myself exclusively to ophthalmic work, and with this intention am on the eve of leaving for the Continent, I should be greatly obliged if you could inform me whether the fact of being a pure ophthalmic surgeon would debar me from appointment to the Liverpool Eye and Ear Infirmary, in case a vacancy should occur at that institution in the future.—I am, yours faithfully,

H. H. Hornby, Esq., J.P.,
Chairman of the Eye and Ear Infirmary.

The Liverpool Eye and Ear Infirmary,
Myrtle Street, August 17th, 1897.

Dear Sir,—Mr. Hornby has handed me your letter of 12th inst. In reply, I write to say that the hon. surgeons and assistant surgeons of our Infirmary are required to attend to cases of both eye and ear disease. Candidates would certainly have to possess some knowledge of both branches.—I am, yours truly,

(Signed) Reginald Haigh, Honorary Secretary.

2. In January, 1911, a vacancy for an assistant surgeon occurred. Dr. Harcourt, F.R.C.S.Eng., M.D., M.Ch. Roy. Univ. Ireland, applied. He was already pathologist and bacteriologist to the Eye and Ear Infirmary—appointed 1907; had for three and a half years spent the greater part of each afternoon at that work, except about two afternoons, when he assisted in the out-patient work. He was a Liverpool ratepayer, and had for some years practically given up general practice in order to devote himself to the study of the eye. The appointment was given to a stranger to Liverpool. Some few months later Dr. Harcourt was appointed by the university authorities "Demonstrator of Ophthalmic Pathology to the Liverpool University," in which capacity he teaches qualified medical men the pathology of the eye in their preparation for the special diploma in ophthalmology. He has also been appointed ophthalmic examiner by the Liverpool Education Committee, and ophthalmic refractionist—with a salary—to the Borough Hospital, Bootle.

3. The Infirmary, therefore, does not obtain the services of men who have elected to make one or other of the specialties their life work. The celebrated oculists, Sir William Bowman and George Critchett in the past generation, and Sir Anderson Critchett (oculist to H.M. King George V), Sir John Tweedy (thrice President of the Royal College of Surgeons of England), Edward Nettleship, Priestley Smith, and the host of distinguished and world-renowned ophthalmologists in the present, would be ineligible for appointment to this "great medical charity," as Mr. Jones calls it. The same applies to the distinguished aurists, the late Joseph Toynbee, Sir William Dalby, and the numerous present-day exponents of the science of otology. Needless to say that the Liverpool specialists in ear, nose, and throat work—a legitimate combination—are excluded.

4. The pioneer of modern otology in Liverpool was Mr. George Stone, selected by Professor Politzer of Vienna to translate his work on *Anatomical and Histological Dissections of the Human Ear*, 1892. Mr. Stone suffered from ear disease in youth, and was cured. He became house-surgeon to the Eye and Ear Infirmary in 1876, and assistant surgeon in 1879, the year in which the subject of otology received for the first time, thanks to the British Medical Association, a distinct recognition in the proceedings of any medical congress in this country, and in consequence a great impetus in scientific investigation. Sir William Dalby, writing in 1890, said, "It is only of recent years that the progress of . . . aural surgery has reached such a point as to attract young surgeons of good abilities and prospects to devote their lives to its practice." Mr. Stone was one of the first of these, and, being a man of means, prosecuted his studies in Vienna for successive years under Professors Politzer and Gruber, and rapidly became recognized as a scientific aurist in this part of the country.

In 1885, a vacancy on the full staff occurring, the Chairman of the Liverpool Eye and Ear Infirmary Committee stated officially and publicly "that so long as Mr. Stone held his views upon the working of the institution—which were that the two branches should be separate and distinct, proposals which would entirely revolutionize the system upon which the institution had hitherto been worked and found to answer well—his appointment would be disadvantageous to the best interests of the Infirmary." These remarks were obviously made with the intention of blocking the election of Mr. Stone.

An effort was made to save the committee from perpetrating this act. The late Major Cross and Mr.—now Sir William—Barrett, urged the appointment of both candidates, "so that there might be a specialist to attend to diseases of the ear," pointing out that "out of a total of 721 in-patients, only 20 were ear cases." The result is to be seen in the following announcement appearing in the columns of the press:

To the Governors and Subscribers of the Liverpool Eye and Ear Infirmary.

My Lords, Ladies, and Gentlemen,

It was my intention to seek election at your hands for the vacancy in the staff of honorary surgeons, caused by the elevation of Mr. T. Shadford Walker to the rank of honorary consulting-surgeon.

In the face, however, of the opinion of the Committee expressed at the annual meeting of the subscribers on Monday last, to the effect:

> That so long as I devoted myself almost exclusively to the treatment of ear cases, and held my views upon the working of the Institution—which were, that the practice of the two branches (the eye and ear) should be separate and distinct—my appointment would be disadvantageous to the best interests of the Infirmary.

And still holding to my views (which are in operation in London, Birmingham, Manchester, Edinburgh, and Glasgow, and the chief Continental cities), I have no alternative but to withdraw from my candidature.

And if in the position of Honorary Surgeon my adherence to those views would be detrimental to the interests of the Institution, they must also be if I remain on the staff as Assistant Honorary Surgeon, and I have, therefore, with much regret placed my resignation in the hands of the Committee.

Thanking those subscribers and friends who had promised to give me their support, I have the honour to remain, my lords, ladies, and gentlemen, your obedient servant,

George Stone.

61, Rodney Street, January 30th, 1885.

Exit the pioneer of scientific aural surgery in Liverpool from this "great" medical charity. Not only are pure specialists debarred, but a member of the staff who develops progressive ideas must clear out.* What inducement is there for a student educated at the Liverpool University to specialize in either ophthalmology or otology, well knowing that however proficient he might become in one or other subject, there would be no chance of a staff appointment for him at the "oldest special hospital" in his own city? I commend this point of view to the authorities of the Liverpool University.

5. The following rule as to assistant surgeons exists at the Liverpool Eye and Ear Infirmary:

Assistant Surgeons.

Rule 3.—They shall assist the surgeons in the attendance on out-patients and in the operations on in-patients. *They shall not* perform *any* operations without permission from the surgeons in charge, *and such permission may not be given to an assistant surgeon under twelve months standing.*

The italics are mine. In the rules of a score or more ophthalmic hospitals through which I have looked, including the Royal London Ophthalmic Hospital, Royal Westminster Ophthalmic Hospital, Birmingham, Manchester, etc., nothing approaching it can be found. It reflects no credit on the gentleman who framed it, on the medical staff who approved of it, or on the committee accepting it.

Imagine the position of assistant surgeons at the Liverpool Royal Infirmary, Northern, Royal Southern, and Stanley Hospitals, if bound by such a rule; and what must be the mental attitude of a senior staff which would for twelve months voluntarily deprive itself—by a general law—of the *surgical* services of an assistant surgeon?

The Eye and Ear Infirmary may be the oldest special hospital in Liverpool, but it is not the most progressive. St. Paul's Eye Hospital—following the example of the Royal London Ophthalmic Hospital—has taken the lead.

The importance of the subject is my excuse for this lengthy communication. Mr. Hugh E. Jones's letter is justification and proof of the statement in the *Daily Post*

*Ophthalmology was in 1878 declared to be separate and distinct from the department of the general surgeon. But this only signified a change in personnel, for the barrier to complete emancipation still remains in the eye and ear specialist.

editorial, that "the association of eye and ear is indefensible" in hospital practice. But, while he hopes "that eventually a complete and separate staff of surgeons will be provided for each department," he adversely criticizes those who would fain hasten the fulfilment of his hopes. Were he conversant with the early history of the hospital of which he is to-day a distinguished officer, he would value even adverse criticism if honestly conceived. "Publicity," wrote one of his notable predecessors, "should not and never need be feared nor shunned by the well-educated and honourably-minded practitioner. An institution like yours can only flourish, can only gain strength and stability, can only grow old in dispensing its many sterling blessings to the indigent classes of this great and multiplying community by *general* PUBLICITY."—I am, etc.,

Liverpool, Oct. 16th. THOMAS H. BICKERTON.

TURBINECTOMY.

SIR,—I wrote a fortnight ago with a view to helping Dr. Wilson to understand that what I meant when I said "removal of the turbinals" was not removal of a portion of the turbinals. This is the only sense in which I can be said to have "repudiated" the report of my remarks.

I willingly admit that my experience of the operation is not great. I am glad to say I have never performed it. But I have seen a good number of cases where it had been performed, and each of them had a dry naso-pharynx, though there was no other sign of nasal disease or predisposing constitutional condition present. This is my point, and this is why I said the only thing I did say on the subject—namely, that "pharyngitis sicca often occurs after removal of the turbinals"; and if Dr. Wilson has had different results from "carefully graduated" operations, or finds it extremely rare for atrophic changes (of which I did not speak) to follow turbinectomy with the spokeshave, that does not affect my observation.

If one were reduced to a choice between nasal obstruction and removal of the turbinals, the necessity for the operation might be maintained, though in that case the utility would have to be shown of conferring nasal respiration on a patient while taking away the organ whose function constitutes the chief reason why nasal respiration is worth having. But no such choice is forced upon us. I have yet to meet the case of nasal obstruction that cannot be amply dealt with without the sacrifice of these important structures.

On the question of terms. Uniformity in nomenclature is impossible to attain, but there are good reasons for following, in "turbinotomy" and "turbinectomy," the parallel expressions of "tonsillotomy" and "tonsillectomy."—I am, etc.,

Dublin, Oct. 20th. ROBERT H. WOODS.

EYESIGHT AND NAVIGATION.

SIR,—In your issue of October 18th Dr. Freeland Fergus states:

> So soon as ever a vessel appears on the horizon, a hypermetropic man will see it equally well with an emmetrope. I myself, with a dioptre and a half of hypermetropic astigmatism against the rule, have no difficulty in the matter whatever; it is purely a question of the velocity of light, not of the velocity of the vessels.

It is a fact well known to me, and no doubt to many ophthalmic surgeons, that patients with simple hypermetropic astigmatism against the rule can rarely be induced to wear distance glasses; they do not require them because, probably by some compensatory lid movement, they get quite good distant vision. To argue therefrom, however, that any hypermetrope can obtain vision as good as an emmetrope seems to me a little absurd, and I am disappointed that Dr. Fergus should lend his well-known authority to this statement. I quite fail to understand the argument with regard to the velocity of light and the velocity of vessels. The interpretation of either must depend on the presence of an efficient organ of sight.

Dr. Fergus also quotes in the same letter the case of a man with 5 dioptres of myopia who "did pilotage" for many a year. He will find, if he makes inquiry, that the pilotage was done by means of binoculars applied to the eyes, and not by the eyes themselves. I have reported similar cases in trawl skippers, who admitted that they would be no use without binoculars.

In my examination before the Sight Tests Committee of the Board of Trade I gave full particulars and percentages (see minutes of examination) of normal candidates rejected by their examiners before and after the addition of the yellow and purple skeins to Holmgren's test. I presume from your annotation of October 4th, "The Board of Trade Colour Vision Tests," that Dr. Fergus refers to this in his pamphlet. I also pointed out that only a small percentage of those rejected appealed, because in case of failure at the appeal examination they have to pay their own expenses to London and back. Consequently it is likely that normal candidates are permanently refused by the present methods of examination.

It seems to me that criticisms of the ⅔ and ⅚ standard, more especially from the shipping side, are founded on a complete misapprehension—namely, that ⅔ means the best possible acuity of vision. After all, ⅔ is only fair average vision, many persons easily obtaining ⅚, ⅘, and even 1.

It must be admitted by every one that good eyesight is the most important requisite in seafaring life, and instead of the Board of Trade lowering its standard of vision in order to obtain candidates of a sort, it would be far safer and better to improve its methods of examination by giving to medical men what is medical men's work—namely, the diagnosis of normal vision. I presume that the Board of Trade would not employ medical men to examine their candidates in navigation, and I hold that lay examination of eyes is even more absurd.—I am, etc.,

Aberdeen, Oct. 19th. A. RUDOLF GALLOWAY.

ARTIFICIAL PNEUMOTHORAX IN A WORKING-CLASS SANATORIUM.

SIR,—To those interested in the subject of artificial pneumothorax as a treatment for pulmonary tuberculosis, but are doubtful of the possibility of using it for patients in a working-class sanatorium, owing to the prolonged time of treatment required, the following series of cases may be of some encouragement.

The numbers are very small, and the series only extends over the last eighteen months, but all the cases were very severe, most of them were febrile, and there was very little prospect that any one of them would recover. Of the 13 cases in which this treatment was attempted, in 4 pneumothorax could not be produced owing to the presence of pleural adhesions. Three cases—2 girls of 14 and 17 and a woman of 50—though their condition was much improved for some time, have since died. Of the remaining 6, 3 are still receiving injections, and all of them are able to do a certain amount of work. One man who had been ill for over two years, and most of the time in bed, has been working as a painter, eight hours a day, for a year. Another is working eight hours on a poultry farm, and 2 others are doing light farm work for several hours a day. One girl has taken a situation as a domestic servant, and the other is able to do light work at home.

With the possibility of giving patients suitable work under good conditions to follow up the treatment by artificial pneumothorax, it is our opinion that the employment of this method for working-class patients is most useful, and would be much more so if the idea of a farm colony to which patients were able to be drafted could be developed.—We are, etc.,

JANE WALKER,
Medical Superintendent.
ELEANOR G. SOLTAU,
Resident Medical Officer.

Maltings Farm Sanatorium, Nayland, Colchester.

THE SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS.

SIR,—Your correspondent, who suggests (p. 1041) that, instead of gas, liquids might be introduced into the pleura, will be interested to know that this has been done in Leeds for some time; paraffin has been used in several cases with various results. Two cases were described at Professor Saugman's meeting during the International Medical Congress in London this year, and others will be published in due course. Tincture of iodine may be, and

has in several instances been, added to the paraffin; in all the cases nitrogen was introduced first.—I am, etc.,

Leeds, Oct. 20th. H. DE CARLE WOODCOCK.

THE ASYLUM SERVICE.

SIR,—In a leading article in the BRITISH MEDICAL JOURNAL of October 18th on the asylum service, it is suggested that assistant medical officers should agree on some temperate statement of their disabilities in view of the proposed Durham conference.

The correspondence which has already appeared in the JOURNAL indicates in its anonymity a difficulty in obtaining the considered judgement of a body of assistant medical officers, no machinery existing for such a purpose.

My object in writing is to invite communications from other assistant medical officers, and, if possible, to set up with them some machinery whereby a considered and authoritative statement of disabilities may be presented.

I am sure all assistant medical officers must be very grateful for the kindly consideration of their difficulties shown in your leading article.—I am, etc.,

F. J. STUART,
Senior Assistant Medical Officer, Northampton County Lunatic Asylum.

October 20th.

REX v. HAMILTON.

SIR,—The following comprise the committee of the above fund, and would be pleased to receive donations:

P. Daniel, Esq., F.R.C.S., 1A, Upper Wimpole Street, W.
S. R. Deane, Esq., M.R.C.S., Scothorne Villa, Lincoln.
Mrs. Moran, Mill Hill House, Barnes.
Miss Gallahar, The Shanty, Abinger Road, Bedford.
Dr. W. H. Gimblett, 86, Sutherland Avenue, W.
Dr. Dobell, The Terrace, Barnes.
Honorary Treasurer, H. Moran, Esq., Mill Hill House, Barnes.

The following are the subscriptions up to date:

	£	s.	d.
F. M. G., Chiswick	10	0	0
H. Somerville, M.R.C.S., Shambrook, Beds ...	0	5	0
J. W. Heekes, M.R.C.S., Barnes	1	1	0
Peter Daniel, F.R.C.S., 1A, Upper Wimpole St.	5	0	0
C. N. Poole, M.R.C.S., Wandsworth	1	1	0
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Mrs. McIntosh, 20, Westmoriand Road, Barnes	5	0	0
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Cecil Johnson, M.B., "Cricklewood," East Sheen	2	2	0
D. C. Dobell, M.B., The Terrace, Barnes ...	2	2	0
W. H. Gimblett, M.D.	2	2	0

—I am, etc.,

London, W., Oct. 21st. W. H. GIMBLETT, M.D.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

THE following candidates have been approved at the examinations indicated:

D.P.H. (*Both Parts*).—W. J. Cran, W. M. Elliott, *R. L. Gamlen, W. G. Hamilton, J. Johnstone, Rose F. Jordan, W. MacAdam, C. R. Macleod, A. MacMillan, G. Milne, J. Paterson, O. Shields, B. K. Singh, R. S. Taylor, J. W. Turner, H. G. Waters, E. C. Williams, A. J. Williamson, G. J. Wilson.

* Distinguished in the practical application of Pathology and Sanitary Science.

Degrees.

The following degrees have been conferred:

M.D.—K. Comyn, C. B. Heald, G. W. Twigg.
M.B., B.C.—R. Gamlin, A. E Herman, A. C. Roxburgh, L. W. K. Scargill, G. A. Smythe.
M.B.—C. C. H. Binns, L. T. Rutherford, T. E. Osmond.
B.C.—R. S. Morshead.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

THE following candidates have been admitted to the Fellowship:

H. E. Arbuckle, J. F. Bennett, J. D. Fiddes, P. L. Foote, McW. Henry, H. F. Holmden, H. C. Mersereau, J. J. H. Nelson, A. B. Pestonji, R. F. Steel, H. M. B. Stratford, A. R. Thomas, S. H. M. West, H. B. Wyman.

CONJOINT BOARD IN IRELAND.

THE following candidates have been approved at the examination indicated:

FIRST COLLEGE.—J. Cusack, L. Finnegan, P. J. Flood, W. F. Moorhead, W. H. Pierce, W. H. Sexton.

Obituary.

JOHN ADAM, M.A., M.D.,

DINGWALL.

THE many friends of Dr. Adam throughout the North of Scotland will receive the news of his sudden death with sincere regret. Although his health for some time past had not been robust he was able to do a fair amount of professional work. After spending the morning of October 18th visiting patients, Dr. Adam returned to his residence, and between two and three o'clock a patient called to see him. Mrs. Adam went upstairs to deliver the message, and her husband, who seemed to be in his usual health, said he would be down in a minute. His non-appearance took Mrs. Adam upstairs again, when she found the doctor lying unconscious on the floor of his bedroom. Medical aid was summoned, but despite every attention Dr. Adam never rallied, and he died a few minutes after midnight.

John Adam was the eldest son of the late Mr. Adam, Humberston, a well-known agriculturist in Ross-shire. He was educated at Dingwall Academy, and subsequently studied at Edinburgh University; there he had a distinguished career, and graduated M.A. in 1873. He then studied medicine, graduating M.B. and C.M. in 1876 and taking the degree of M.D. in 1881. Shortly afterwards he commenced practice in Dingwall, and continued to do so until his death. He was medical officer for several parishes, and discharged the important duties connected with this wide district with unflagging zeal, tact, and ability. In his professional capacity he was always at the call of duty, ceaseless in his attention to his patients; time and distance were seldom considered, and his unfailing urbanity and kindness made him welcome wherever he went. To the poor and needy his kindness was unfailing, and he often gave medical attention without any prospect of fee or reward.

Dr. Adam took a prominent part in the public life of Dingwall; for many years he was a member of the town council; he showed a great interest in education, and for eleven years was an active member of the school board. In 1884 he joined the Volunteer Force, and in 1904 attained the rank of lieutenant-colonel, and was senior medical officer of the Seaforth and Cameron Brigade. For many years he was surgeon to the Ross Memorial Hospital, an institution in which he took a great interest. Some years ago, under the strain of hard work, his health broke down, and he was presented with a handsome testimonial; it enabled him to take a lengthened trip to Africa, by which his health was restored.

Dr. Adam was a member of the British Medical Association, and a past-president of the Northern Counties of Scotland Branch, and took a keen interest in its affairs. He was a strong opponent of the Insurance Act, and refused to allow his name to go on the panel.

Dr. Adam was 60 years of age, and is survived by Mrs. Adam and two daughters, to whom the sympathy of numerous friends in the North of Scotland is extended.

THOMAS WILSON, M.R.C.S.ENG., L.R.C.P.EDIN.,

WALLSEND.

THE death of Dr. Thomas Wilson, which took place, after a short illness, at Wallsend on October 18th, has closed an exceptional medical career. In the Tyneside area he was a most familiar figure, and was held in the highest esteem by all with whom he came in contact. He was born at Darlington in 1834, and was in his 79th year. After attending school at Darlington he studied at the College of Medicine, Newcastle. While attending lectures he acted as pupil-apprentice to Dr. Thompson at Jarrow. The face of Tyneside has altered vastly since those days. In order to reach his classes Dr. Wilson was often obliged to utilize a sculling boat, and not infrequently he got aground on sandbanks, for the Tyne, on which huge *Dreadnoughts* now float easily, was at that time very shallow in parts. It is now nearly fifty years ago since Dr. Wilson established himself in practice

at Wallsend. The growth of this busy centre of shipbuilding and engineering is coincident with his life in the district. It is reflected in his association with the public health service. On the establishment of the Wallsend Board of Health he was appointed part-time medical officer. Later, on the formation of the urban district council, he was retained as the medical officer, and more recently, when Wallsend became a borough, he continued as medical officer to the town council. It is only a little over a year ago that he resigned, and was succeeded by a full-time officer. The valued advice, however, of Dr. Wilson was still available, for he was appointed consulting medical officer. It will thus be seen that he passed through every phase of the public health service up to the time of his death. Dr. Wilson's activity and energy were always in evidence; he was an indefatigable worker, both in his public service and in his private practice. From the latter he retired about fourteen years ago. He was the senior medical referee in the country for the Prudential Insurance Company.

At one time he was an active politician and was a staunch Conservative. In his later years the turmoil of party politics ceased to have any charm for him. He was a devout and devoted member of the Church of England. He took great interest in the affairs of the British Medical Association, and for many years regularly attended the annual meetings.

Dr. Wilson's wife died three years ago. Her father, grandfather, and great-grandfather were medical practitioners, as were several other members of her family. His two sons and four daughters are all living. They are: Dr. Alfred Wilson, who carries on the Wallsend practice, and Dr. Thomas Wilson, now in practice at Gilgandra, New South Wales; the eldest daughter married Dr. Drury, of Halifax; the second, Mr. Arthur Swordy, of Newcastle; the third daughter, Dr. Donald Bremner Waters, of Walkeringham; and the youngest, Dr. William Stuart Milne (Federated Malay State Medical Service).

The funeral took place at the Jesmond Cemetery on Monday, October 20th.

THE LATE SIR JOHN BATTY TUKE.

A service in connexion with the funeral of Sir John Batty Tuke was held in St. John's Church, Princes Street, Edinburgh, on October 16th. The President and Fellows of the Royal College of Physicians attended, and there were also representatives from the Royal College of Surgeons, the University, and the Edinburgh and St. Andrews Conservative Association. Thereafter, the remains were conveyed to the Crematorium, Glasgow.

The friends of Dr. Samuel Poole, of Wolverhampton, will regret to hear that he died in that town on October 17th after a very short illness. A few days after his return from a holiday abroad some three weeks ago, he experienced symptoms which indicated the necessity of an operation on the gall bladder, and from this he never rallied. A Lancashire man by birth, Dr. Poole, after completion of his general education at Hutton Grammar School, became an undergraduate at Edinburgh, where in 1889 he received the degrees of M.B., C.M. A few years later he proceeded to the M.D. of the same university, and at a comparatively recent date acquired a diploma in public health from the Conjoint Board in Ireland. He began work as practitioner as an assistant in the Rhondda Valley, but had been resident in Wolverhampton for some seventeen years. At the time of his death his practice was large, a good deal of it lying among the less wealthy classes, by whom in particular his services will much be missed. His work included that of Poor Law medical officer and of public vaccinator for one of the districts of Wolverhampton, and he was also a medical referee under the Workmen's Compensation Act. He was a member of the British Medical Association, and outside his professional work Dr. Poole took an interest in Freemasonry, and at one time aspired to a position on the town council. Dr. Poole, who at the date of his death was in the 49th year of his age, was never married.

Medico-Legal.

ACTION AGAINST THE BRITISH MEDICAL ASSOCIATION.

Settlement in Court.

At the Bedford Assizes, on October 17th and 18th, Mr. Justice Rowlatt, sitting with a special jury, heard the case of Sloman *v.* The British Medical Association, Dr. Butters, Dr. G. H. Goldsmith, and Dr. S. J. Ross. The plaintiff, Dr. Herbert Sloman, L.R.C.P., M.R.C.S., sought a declaration that certain resolutions passed by the Bedford and Herts Division and the Bedford Division of the South Midland Branch of the defendant Association, being *ultra vires*, were null and void. He also claimed damages for libels alleged to be contained in a resolution dated October 1st, 1908, passed by the Executive Committee of the Bedford Division, and in a circular announcing the agenda for a meeting of the same Division to be held on June 20th, 1912, and in a resolution passed at that meeting. He also claimed damages for an alleged slander by Dr. Butters.

Mr. Hugo Young, K.C., and Mr. Alec Neilson (instructed by Mr. Guilford E. Lewis) appeared for the plaintiff; Mr. Hollis Walker, K.C., and Mr. H. H. Joy (instructed by Messrs. Hempsons) for the defendants.

According to a report in the *Bedford and County Record* (October 21st), Mr. Neilson, in opening the pleadings, said the plaintiff was Herbert Sloman, and the defendants were the British Medical Association, together with George Butters, George Harvey Goldsmith, and Stephen John Ross. The plaintiff claimed a declaration that certain resolutions passed by the defendant Association should be null and void, and of no effect, and were passed *ultra vires* of the Association. He also claimed damages for libel against the defendant, Dr. Goldsmith, and the Association, and for slander against the defendant Dr. Butters. By their defence all the defendants admitted that the resolutions were passed, but denied that they were passed *ultra vires*. As regards the libels and slanders, they admitted that the words were uttered, but said they were uttered on a privileged occasion.

Mr. Hugo Young, K.C., in addressing the jury, said the plaintiff had been for some thirty years a member of the British Medical Association, and his action was against individuals who had taken an active part in proposing and seconding certain resolutions. All the facts and documents were admitted. Herbert Sloman had been practising for a considerable time in Scotland, but thought he would return to England and practise. Through the Scholastic, Clerical, and Medical Agency his attention was drawn to an advertisement which had been inserted in a medical paper by Dr. Clark, who was practising in Bedford—namely: "For transfer a practice in a county town in the South Midlands, about one hour by rail from London. Established by the vendor about eleven years ago. Cash receipts for 1904-5-6 averaged between £250 and £300 a year, including appointment worth about £50 to £60 per annum. Clubs and dispensary. Well situated semi-detached house. Premium £350. The vendor is of opinion that energetic man could largely increase the practice. Vendor is relinquishing for private reasons unconnected with the practice." Plaintiff being willing to accept a practice in Bedford came and saw Dr. Clark. The result of the interview was that he said he was prepared to buy the practice, but as the books were not added up, and Dr. Clark said he wanted some days to get the books in order, plaintiff said that, subject to examination by an accountant, and all turning out satisfactory, he should be prepared to negotiate. On May 6th he wrote to Mr. Stocker, the representative of the agency, describing the circumstances, and suggesting that the visit of an accountant was necessary, adding that he understood that one-third of the fees arose outside Bedford. Dr. Sloman's offer to purchase the practice was entered upon with the greatest bona fides and desire to buy subject to investigation. On May 10th the accountant reported that the receipts in the day book for the last three years were: 1907, £100, appointments £38; 1906, £239, appointments £40; 1905, £166, appointments £67—being an average of £217 per annum. Included in the receipts for 1905-6 were sums of £96 12s. and £19 15s. from a patient now deceased. Taking that patient away reduced the average by £38 to £179 a year. The outside practice, it appeared, was connected with a branch surgery in a cottage at Wootton. That result was very unsatisfactory to Dr. Sloman, who, on May 18th, wrote to say that, as the value of the practice was so much less than he had been led to expect, and there was so much difficulty and uncertainty about getting a suitable house, and the personal introductions would be so difficult to carry out, he did not wish to go any further into the matter. Learned counsel said he did not think it germane to the inquiry to investigate the rights and wrongs of the case as between Dr. Clark and Dr. Sloman, but it was necessary to explain that Dr. Sloman had made arrangements, at great expense, to have his furniture sent from Scotland to Bedford, and he was left in the position that he was not able to buy the practice; he had no other offered to him at the moment, and he had decided to stop in Bedford and get what patients he could by letting it be known that he was willing to accept them. That was the beginning of what he might call a system of persecution by the other doctors against this unfortunate gentleman. It appeared to be suggested that no man had a right to come into Bedford and practise unless he bought somebody else's practice. Even if that were

a rule of the medical profession, it did not justify what had been done to this man. His attempt to buy the practice was perfectly bona fide, but he was informed by Dr. Clark and by Mr. Stocker that it was no use offering a less price than that which was asked.

The British Medical Association had an Ethical Committee for the purpose of investigating matters of etiquette among medical men. The Bedford Branch had also an Executive Committee, which was the local Ethical Committee. Dr. Clark, feeling a grievance against Dr. Sloman, on November 7th, 1907, made complaint to the Central Committee that Dr. Sloman in the previous May had promised verbally to sign an agreement to purchase his practice, and a few days later declined to do so. Since then he had come to practise near him (Dr. Clark), and in a position likely to injure his practice. As Dr. Sloman had not paid him the customary professional call, he thought it would be better that the correspondence should take place through a third party. Owing to some delay in getting a reply, Dr. Clark withdrew his complaint from the central authority, and said he should send it to the local committee, briefly stating the case on December 3rd, and that the one question he was placing before the committee was Dr. Sloman's ethical conduct in starting in opposition to him. Then followed correspondence on the mode of procedure, the essence of which appeared to be that the complainant should satisfy the committee that he had personally or by letter afforded the respondent an opportunity for explanation. On December 19th Dr. Clark wrote to Dr. Sloman asking him for an explanation of the conduct complained of, and in reply Dr. Sloman wrote that he failed to see that his conduct required further explanation than was given in his last letter to Dr. Clark. This was a letter of May 18th, which stated that "as the value of your practice is so much less than I had been led to understand, I do not want to go further into the matter." On January 9th Dr. Clark was written to by Dr. Cobb, the secretary, for a categorical statement of facts, and again in February. On February 17th he sent a long statement, but substantially it said that Dr. Sloman came to buy his practice but did not, and started a practice on his own account. On February 26th Dr. Sloman had sent in a detailed statement of his answers to Dr. Clark's allegations. Both parties having agreed to submit to arbitration, they were heard on February 27th before the Ethical Committee of the Division, and the following resolution was passed:

> We are of opinion that Dr. Sloman came to Bedford solely with a view to purchasing Dr. Clark's practice, that he broke off negotiations for the purchase of the practice because he found the value thereof, as reported by the accountant, was not satisfactory; that Dr. Sloman was fully entitled to break off the negotiations, but, having negotiated thus far, we are unanimously of opinion that Dr. Sloman unwisely offended against the recognized rules of the medical profession in immediately starting in practice in Bedford in close proximity to Dr. Clark.

That established his bona fides, but Dr. Sloman accepted the decision. There was no order in the resolution, but it simply expressed an opinion, and that was enough for him. He was anxious to put himself right with the British Medical Association, and took steps at once to do so under the rules. On March 22nd, Dr. Sloman wrote that he had been awaiting some suggestions as to how he might make reparations to Dr. Clark. His decision to start in Bedford was arrived at after consultation with other medical men, and his coming to Bedford was due to Dr. Clark's representations of his practice. They all felt that this relieved him from obligation to Dr. Clark. He was, of course, ready to make Dr. Clark an offer to buy his practice at a price calculated on the accountant's report, and he made this offer in order to show his disposition to make amends, and offer an apology to Dr. Clark for any inconvenience caused by an unfortunante error of judgement. Dr. Sloman was so anxious that no information as to the vendor's intentions or otherwise detrimental to Dr. Clark should become known, that as soon as the negotiations fell through he destroyed the reports and list of fees he had received. On March 26th, 1908, a general meeting of the Bedfordshire and Hertfordshire Division was held, and the minutes were as follows: "The report of the Ethical Committee was then read upon a case of disagreement between two members of the medical profession. The chairman then read a letter from Dr. Sloman in which he admits his error, and offers still to purchase Dr. Clark's practice or to agree not to attend any of his patients. It was then proposed by Dr. Coombs and seconded by Dr. Chillingworth:

> That the report be approved, and that one of the parties be held to have violated the rules of the Division in respect to professional conduct or the ordinary accepted rules of the profession, and that he be called upon suitably to apologize to the other, or to the members of the Division generally.

This, having been put to the meeting, was carried unanimously." Mr. W. G. Nash then proposed and Dr. Coombs seconded the resolution which, learned counsel said, was entirely *ultra vires*—namely, that Dr. Sloman should be called upon to fulfil his promise to purchase Dr. Clark's practice on the usual terms and apologize to him; that in the event of terms not being agreed upon, Dr. Sloman should undertake not to attend any of Dr. Clark's patients for the next three years. On April 1st plaintiff wrote to Dr. Clark to the effect that as the executive had found that he was wrong in commencing practice in Bedford after breaking off the negotiations, and he had intimated a wish to make amends by reopening negotiations to purchase at a price based on the accountant's report, he made an offer of £270. But, if Dr. Clark adhered to his decision not to sell it, he (Dr. Sloman) undertook not to attend any of Dr. Clark's patients in Bedford. Counsel added that plaintiff had not up to the present attended any of Dr. Clark's patients. In reply, Dr. Clark wrote that he was unable to give a definite answer; last May he was sanguine, and knew of a place to start practising in, but he was now married, and did not know of an opening. Other letters followed, and in one Dr. Clark intimated his willingness to accept £270 provided the accountant's figures were correct. The negotiations extended over a long time, but the parties seemed unable to come to terms.

In July, 1908, a proposal emanated from the Executive that the President of the South Midland Branch should be asked to act as arbiter in the matter of the negotiations.

On October 1st, 1908, the Executive Committee met, and a letter was read from Dr. Clark in which he stated that he was not anxious to sell his practice to Dr. Sloman, and the cause of his complaint was still going on. Thereupon, said learned counsel, the following resolution was passed:

> That this committee is of opinion that Dr. Sloman in coming to Bedford ostensibly to purchase a practice, and having obtained an insight into that practice, and negotiations having failed, the committee is still of opinion that Dr. Sloman violates the rules of professional conduct by remaining in practice in Bedford.

This could only mean that he came pretending to buy, and having obtained an insight into the business threw it aside, although by their resolution of February 26th they had declared their opinion that he came to Bedford solely with a view to purchasing Dr. Clark's practice. It was next resolved to send a copy of the resolution to each member of the Division. A greater slur upon a medical man could hardly be circulated, and that was sent out to the doctors in a halfpenny wrapper.

Mr. Walker, K.C., said there was no allegation of publication to any one but members of the Division.

Mr. Young, K.C., said he did not suggest there was, but it showed very little care. Nothing more was do e for four years. The three years had run out, and plaintiff had not attended any of Dr. Clark's patients. On March 12th, 1912, the case of Dr. Sloman was brought up and discussed at the Executive Committee, as regards his being met in consultation. The Secretary was asked to obtain a copy of the ethical rules of the Association. An agenda was sent out in May with a notice that the Executive Committee, acting as the Ethical Committee, was of the opinion that the resolution passed at the Divisional meeting on October 1st, 1908, still held good, and the Chairman would move a resolution that no member of the Association shall meet in consultation anyone who had been guilty of unprofessional conduct, and on June 20th that resolution was passed on the motion of Dr. Butters. It was proposed by Dr. Nash and seconded by Dr. G. H. Goldsmith, that the Secretary send the resolution to the Central Ethical Committee according to Rule Z, and await instructions. These gentlemen were again anxious to circularize the documents, but their intention could not be put into action because it was pointed out by the central executive that the rule had no application. A letter was sent to the central Association stating that Mr. Sloman was found by the Executive Committee to be violating professional rules by remaining in practice in Bedford, but that certain members had been meeting Mr. Sloman in practice, and did not understand the meaning of the resolution. In reply a letter of June 26th, from the central to the local, stated that the circulation of such intimation to non-members, except in strict accordance with Rule Z (which the local Division had not adopted) would probably lead to legal proceedings, and the central committee strongly deprecated such circulation. In connexion with the rule which laid down the procedure (such as submitting a report of the whole facts to the Central Ethical Committee) there was a note: "The Central Ethical Committee desires to draw attention of the Divisions to the necessity of notices such as the above being circulated in sealed envelopes and marked "Private and confidential for the use of members of the So-and-So Division exclusively." But the local committee, having passed this resolution, did not refer it to the central committee before they circularized it, but had sent it out in ½d. wrappers on their own account, and when they referred to the central committee were told at once how wrongly they had acted.

Dr. Sloman wrote that he should be glad to know upon what grounds the charges formulated at the meeting on June 12th were passed, and in reply got an extraordinary letter, in which it was stated that so far as the writer knew no charges were formulated. It was merely a question as to whether the findings of the committee in the Division still held good. They could hardly be surprised, commented Mr. Young, that Dr. Sloman thought it was time to consult his legal advisers. On December 14th, 1912, they wrote to Dr. Goldsmith, Secretary of the Bedfordshire and Hertfordshire Division of the British Medical Association: "Sir,—I have been consulted by Dr. Sloman, of 65, Goldington Road, Bedford, relative to a series of resolutions which have been passed by the local Division of the British Medical Association reflecting upon his conduct, which originated as far back as February, 1908, when the complaint made by Dr. Clark, of Bedford, was brought before the meeting of the Executive Committee on February 27th of that year. I do not propose to enter into the various matters which have transpired, because they must be as well known to the Executive of your Association as they are to me, but I have in particular to call your attention to the fact that Dr. Sloman having in all ways complied with the wishes of the committee as expressed in the resolution of March 26th, 1908, and leaving aside the question as to whether the resolution was justified or

not, none of the subsequent resolutions appear to me either justified according to the rules of your Association, or by the facts, and that the matter having rested from the holding of the meeting on October 1st, 1908, to June, 1912, I cannot perceive the slightest justification or reason for the matter being pursued further by the resolution passed at the annual general meeting of that date. My present object is to obtain information so as to enable me to advise Dr. Sloman as to his rights in this matter. He is a member of the British Medical Association, and as such, I think you will admit is entitled to the information which I seek.

"Apart altogether from this, however, as a man accused he is entitled to know upon what grounds he is accused and has been judged, and I have to ask you, therefore, to be good enough to inform me as to any complaint which may have been made against him and upon which he has been adjudged to be guilty of unprofessional conduct at the various meetings which have been held of the Executive Committee and of the members of the Divisional Association from and after the meeting held on March 26th, 1908. If any complaints have been made in writing I ask you to be good enough to supply me with a copy of such writing, and if verbal, then will you be good enough to explain to me exactly what has been from time to time stated, and by whom.

"Dr. Sloman instructs me that he had no previous notice or warning that his conduct would be considered at the various meetings of the Executive Committee, other than that held on February 27th, 1908, and that no information has been given him which would have enabled him to defend himself, whilst as to the annual meeting held on June 20th, 1912, Dr. Sloman received—I presume in common with all other members of the Division—a notification distinctly libellous, unenclosed, in a halfpenny wrapper. I shall also be glad to know in what other respect you justify the proceedings of the Executive Committee and the officers in proceeding with a complaint extending over a period of five years."

In a postscript the writer added: "Since writing the above I have seen copies of letters written by Dr. Sloman to you, to which I must draw your attention and ask for compliance, as it seems incredible that there should be any delay or difficulty in affording the information which my client asks. Not the least important request is that for a copy of the rules of procedure of the committee in force when the resolution of February 27th, 1908, was passed, and since that date to the present moment."

The same date the solicitor wrote also to the Secretary of the British Medical Association, London, as follows: "I have been consulted by Dr. Sloman, of 65, Goldington Road, Bedford, relative to a series of resolutions which have been passed by the Bedfordshire and Hertfordshire Division of the British Medical Association, and I enclose herewith a copy of letter which I am to-day writing to the Secretary of that Division.

"It appears to me that my client has been subjected to a systematic persecution at the hands of this Association for the past five years, and whilst I am aware that the complaint made originated at the instance of Dr. Clark, of Bedford, who was not then and is not now, a member of your Association, the complaint being made against one who was and is a member, which in itself is contrary to the rules, I find that from time to time the matter was pursued in the most relentless manner, that resolutions were passed reflecting upon my client both professionally and socially, that these resolutions were circulated throughout the district amongst his professional brethren and generally became known throughout the district in which he sought to practise; that no previous intimation that his conduct was to be considered or that any complaint had been made was given to him when he could have been afforded an opportunity of defending himself and that the matter having been allowed to sleep from October 1st, 1908, until June 20th, 1912, the matter was brought up afresh at the annual general meeting of the members of the Division, when a further resolution was passed warning all medical men that my client was an unfit person to be met in consultation.

"I know as a fact that this matter has already been brought to the attention of the Executive of your Association in London, but despite this the officers of the Bedfordshire and Hertfordshire Division have been allowed to pursue the matter to the utmost limits of their desire to injure Dr. Sloman.

"As you will find in the letter which I have written to the Secretary of the local Division, I desire to know the grounds and complaints upon which the various resolutions have been passed regarding Dr. Sloman's conduct. Up to the present moment this information has not been afforded which in itself is contrary to the rules which govern the Association, and I trust that you will take such steps as may be necessary to influence the local Secretary to comply with my request, which you must admit is a reasonable one, not alone having regard to the fact that Dr. Sloman is a member of your Association, but also that his conduct has been considered and him condemned without previous notice and in his absence.

"The object of my request is that I may be enabled to advise Dr. Sloman as to the course which is open to him to pursue in order to vindicate his honour both professionally and socially.

"I need hardly point out that the effect of the resolutions being passed and circulated as they have been throughout the district has been to cause Dr. Sloman intense pain and injury. For my part, I am entirely unable to see what power either under the rules of the Division or upon the facts as they exist the local committee have had to pursue Dr. Sloman as they have done, and I shall be glad if you will refer me to the rules which govern their conduct.—I am, Sir, your obedient servant."

The only defence, commented counsel, that was practicable was that these resolutions were privileged. There could be no privilege, he submitted, where people professing to act under rules acted in a manner in no way justified by those rules, because their only protection could be that they were carrying out the rules. The moment arbitration was closed they were acting outside the rules, but four years later they raked the matter up again, after authorizing him to stay. He asked for considerable damages. It was not necessary to prove the loss of a farthing. If the jury thought a libel had been published and a slander uttered, they could give such damages as they thought fair to mark their sense of such conduct. He asked the jury to establish Dr. Sloman in Bedford and to say that he had acted right from beginning to end.

Evidence of the Plaintiff.

Dr. Sloman, in evidence, said in 1907 he was practising at Edinburgh, and for family reasons he disposed of his practice to come to Bedford. He was introduced to this practice at Bedford and interviewed Dr. Clark, and made up his mind to purchase the practice if the accountant's report were satisfactory. There were very material differences in the figures between those given in the advertisement and those given by the accountant, and he wrote declining. At that time he had brought his furniture to Bedford, and he looked round for a house to live in, and took one in Goldington Road, because that district was then developing. On August 28th he put up his plate. At that time he destroyed all the papers he had received regarding Dr. Clark's practice. He had never attended Dr. Clark's patients. He called on almost every medical practitioner in the town, and heard no complaint up to December 19th. On that date he received a letter from Dr. Cobb. He received a letter to attend a meeting on February 27th, and attended with Dr. Clark before the meeting. He thought that meeting ended the matter. In March, in accordance with the resolution of the Association, he reopened the question of purchasing the practice, and Mr. Hempson conducted the negotiations for him, but they could not come to terms. On June 15th Mr. Hempson wrote Dr. Clark to this effect, breaking off negotiations. He never knew his affairs were to be discussed in June or July. He received a notice of a meeting to be held on October 1st, but he did not remember any mention of his business being included. Between February, 1908, and October, 1908, no further information had been required of him. So far as he knew he had not offended against professional etiquette in the four subsequent years. No warning was given to him of the Ethical Committee having come to any fresh opinion; and he knew of no reason for the raking up of this matter except that some of the doctors were meeting him after they had promised they would not. The result was that doctors, instead of meeting him *sub rosa*, would not meet him at all. In one case another doctor declined consultation with him. He conferred with another doctor, and he made arrangements to talk with the first doctor. After the patient got well the other doctor took over the patient altogether.

At the conclusion of Dr. Sloman's evidence in chief the Court adjourned until Saturday morning,

The plaintiff, cross-examined by Mr. Hollis Walker, K.C., said the British Medical Association was the principal organization of the profession, and its decisions carried the greatest weight. It was concerned in upholding the honour and dignity of the profession and dealing with questions of medical etiquette. He had arranged to bring his furniture to Bedford before he had broken off negotiations with Dr. Clark. Referred to a letter from Longhurst and Skinner, dated May 22nd, stating that they had that day sent their foreman for the furniture, plaintiff was asked if the furniture was packed four days after the negotiations were broken off. He replied, "Possibly," but he had to get out of his house by the Scottish quarter-day, which was May 28th. He commenced practice on August 28th, having consulted other men, who said that under the circumstances they considered he was perfectly justified. It did occur to him that other people might take a different view, and on June 11th Mr. Stocker wrote: "I should like to have your assurance that you do not propose to practise there, as it seems to me that it would be hardly the correct thing to do after the length to which your negotiations with Dr. Clark went." He appreciated that. He did not reply to that letter. When he started practice he did not call upon Dr. Clark.

Why not?—Well, would you? (Laughter.)

Why didn't you?—Owing to what had gone before.

Where he started practice was within one-third of a mile of where Dr. Clark lived, and on the same side of the town. The house he took was about 400 yards from one of two houses that he had discussed with Dr. Clark. He was not aware until until December that Dr. Clark had started a complaint against him on November 7th, and he never had the accusation sent direct to him; he had only extracts sent by the secretary, and they conveyed to a certain extent what the accusations were. Before the committee he was heard partially, and had not a full opportunity of saying what he pleased. He had not officially complained that he was not properly heard. The finding of the committee on February 27th, 1908, was communicated to him at the meeting. Asked if he still said that the committee had nothing further to do with it, and why he wrote his letter of March 22nd, plaintiff said the Ethical Committee was one thing and the General Committee was another. He expected

them to deal with the question, and his complaint was that they never gave him instructions what he was expected to do. He expected there was something more for the General Meeting to do than merely receive the report.

On May 13th he wrote to Dr. Hartley, Chairman of the Division, stating that he had offered to buy Dr. Clark's practice, but certain points in the agreement required adjustment; so that a sale could not be reported. He was going to report because he had promised to make the offer, and been given to understand that he should report the purchase. He had not heard of a suggested arbitration before the meeting in June. Dr. Kinsey advised him to refer his case to the Central Board, but he did not remember that Dr. Kinsey advised him to tell his version to the Local Committee. He wrote to the then secretary that, in the event of the negotiations failing, he undertook not to attend any of Dr. Clark's patients while he was in Bedford for a stipulated period (which he had already done), and that the committee had no power to refer the case to arbitration without his consent. He did not know that this matter was coming up on October 1st, 1908. Dr. Kinsey did not advise him to go before the committee after the idea of arbitration had been given up. When a copy of the minute of October 1st was sent to him, he did not write and protest against it or appeal. He did not suggest to any of the members that they were actuated by other than a desire to do right to him. If he did not think they were actuated by a desire to do right to him, he did not say so because that meant litigation. From his previous experience of how these matters were heard, he considered there was no chance of getting justice from the Central Committee.

The Central Committee was not connected with Bedford?—Only through its chairman.

Dr. Kinsey was doing all he could to befriend you?—He appeared to be.

Did you think at that time he was?—I thought at first he was.

Did you think in 1908 he was doing what he could?—Yes.

Then why not appeal to a body which was presided over by a friendly doctor?—Because even at that date I had come to the conclusion that I could not trust them.

You could not trust the members of your profession?—No.

You have a poor opinion of doctors?—Some of them.

Not all of them?—Not all of them form the committee.

At any rate, from October, 1908, to 1912 you took absolutely no step whatever?—No.

Plaintiff said he was not aware that in those four years the Association did anything further in the matter, and he had nothing to allege against the co-defendants personally between those dates. In the interval there was some diversity of practice with regard to meeting him, and one would have wished that uniformity of practice should be adopted. Until the agenda paper of 1912 he was never officially informed that they would not meet him. Asked who was the proper body to deal with this question, plaintiff said he could not suggest a better body than the British Medical Association.

The Judge: Subject to a certain proviso. It was the proper body to deal with it in a certain way, but that is the trouble.

Plaintiff said hat when he had a copy of the agenda he did not attend the meeting because he did not think he could throw any fresh light upon it. Dr. Kinsey asked him if he was going, and said he was going, but did not say for what purpose. He (plaintiff) did not believe that Dr. Kinsey was going in his interests. He did not protest immediately, because he was a poor man and knew what litigation meant. In his estimation it was no use protesting further to a medical tribunal. He had not protested against any of these resolutions until this action was brought. In July, 1908, he wrote to the Central Ethical Committee asking if there was power to compel him to go to arbitration without his consent, and that appeal was so far successful that that body admitted that he had carried out what he had undertaken to do, and said they had no power to require arbitration.

A lengthy correspondence was then read to the effect that various efforts were made to get the question referred to the arbitrament of the British Medical Association, and prevent a matter of intraprofessional interest becoming the subject of litigation in a public court.

Plaintiff was asked if he realized that he was charging three professional gentlemen with malice, and he said that as officials they made these propositions. He presumed that they had a certain feeling in their minds or they would not have done so, but as they had not spoken to him personally since, he could only judge by the resolutions. Dr. Goldsmith seconded the resolution in June, but he did not accuse Dr. Goldsmith of being actuated by malice toward him personally.

On the contrary, I think Dr. Goldsmith has been of very great assistance to you?—He was.

Do you say he was not honest in being of assistance to you?—I do not for a moment.

Counsel quoted from a letter by plaintiff to Dr. Goldsmith stating that the latter had treated him in a manly and gentlemanly way, and always placed all documents and letters at his disposal, and asked: That letter is true to-day?—Yes.

In re examination by Mr. Young, K.C., plaintiff said he accepted the terms of Longhurst and Skinner on May 9th or 10th, and on May 22nd they sent two vans to fetch the furniture. He had taken a house in Bedford provisionally. He was practising from August 28th to December 19th, and there was nothing to prevent Dr. Clark writing to him in the meantime. He never promised to purchase Dr. Clark's practice unconditionally; it was always subject to investigation and its turning out satisfactory. Asked what was the procedure adopted at the meeting on February 27th, plaintiff said they were ushered into a room. Dr. Clark was asked to give some explanation of what had occurred. Plaintiff was not allowed to cross examine him. The remarks were not given on oath. Plaintiff gave his version, and asked to be allowed to question Dr. Clark to test certain statements he had made in his detailed accusation. At first there was a murmur from two or three that he should not be allowed to ask questions about statements which he was able to prove were absolutely false. He then appealed to the Chairman, who thought that he might hand up questions to be put through the chair. There were fifteen questions, but when five had been put, certain gentlemen murmured that it was quite sufficient, and they did not want to hear any more. He was given to understand that Dr. Hartley thought it was for plaintiff to report to the Division whether he (plaintiff) had bought or not bought the practice. After the lapse of years he did not think the Association had anything to do with condemning him or dealing with him.

Counsel quoted the minute of June 20th, 1912: "That this Division is of opinion that none of its members should meet in consultation any medical practitioner who has been found guilty of professional misconduct." It was said in the defence that the word was "unprofessional conduct."

Mr. Walker, K.C.: In the agenda the other expression is used. That is where the confusion has arisen.

This concluded the plaintiff's case.

The following account of what then took place is taken from a transcript of the shorthand writer's notes:

Mr. Justice Rowlatt: Now, Mr. Walker, this action is after all an action for libel. Take the resolution of October 1st, 1908, as the best instance of it, because the others are perhaps echoes of it. This gentleman is accused there, so it is said, of having only ostensibly come to live at Bedford, and with having set up in practice after he got an insight into Dr. Clark's practice. Of course, it may be considered that this is rather a nasty reflection. Now, your defence is not a justification.

Mr. Hollis Walker: No, my lord.

Mr. Justice Rowlatt: But it is privilege.

Mr. Hollis Walker: Yes.

Mr. Justice Rowlatt: And that means that the British Medical Association and these gentlemen say that, although it is not true that these gentlemen did that, they are not responsible for the injury done to him, because of the privilege attaching to the communication.

Mr. Hollis Walker: Quite so.

Mr. Justice Rowlatt: That may be a very nice question, but it appears to me at present that that resolution was passed without the plaintiff ever having been told that he was going to be accused of ostensibly coming to Bedford, and, after having obtained an insight into this gentleman's practice, setting up in competition against him. Nor does it appear clearly—I do not know what you will say about it—that there was any justification by inference or otherwise for the Branch passing that resolution. It just occurs to me whether the British Medical Association might not take the line that under those circumstances it was not a question of whether they could make a good plea of privilege. This gentleman has complained of what took place, and they hear now that their officials did the thing complained of—it may be said *ex parte* and without particular powers. Having heard that, Is there not any way by which peace with honour could be arrived at?

Mr. Hollis Walker: That is what the British Medical Association has desired, and that is why the Association desired that this matter should be reopened.

Mr. Justice Rowlatt: I do not want to keep any discussion of this kind up. I am here to try this case, but the medical profession is one of the greatest professions, and any organization that watches over the interests and the honour of the medical profession is an organization whose standing everybody would desire not to see questioned in any sort of way. Is it not for them to be great about the matter, and when they find that there has been some irregularity in the past to take a higher line than set up in the question of privilege?

Mr. Hollis Walker: What I think they are fighting now is, as has been said in court, the accusations made against their own honour. Acting for the British Medical Association, I say they would be very glad to accept your Lordship's suggestions, but they cannot do that at the risk of making it appear that they are acquiescing in the accusations against their honour as made by the plaintiff; that is the difficulty.

Mr. Justice Rowlatt: What is the accusation against their honour? It has been suggested that there has been a very insufficient appreciation of what is very distinctive in our own profession.

Mr. Hollis Walker: The accusation is about their persecuting a brother doctor for five years.

Mr. Justice Rowlatt: That might utterly be put aside. This is a great Association with a central organization, and I should have thought it was possible that the central body, the real governing body, might come down and say that there has been an irregularity locally which has no doubt caused a great deal of feeling, and has unfortunately led to things being said on one side or the other; now away with it; there has been that irregularity, and the thing can be put right.

Mr. Hollis Walker: I think that could be done in a moment if that were the attitude of the other side.

Mr. Justice Rowlatt: I think it ought to be.

Mr. Hollis Walker: If it were said that this matter, perhaps in a hurry or for some other reason, has been gone through irregularly.

Mr. Justice Rowlatt: They would not be giving too much away if they said that it was done without prudence.

Mr. Hollis Walker: And without protest.

Mr. Justice Rowlatt: With regard to it being without protest, that after all is a small matter.

Mr. Hollis Walker: That, I confess, is the difficulty, but I will speak to my learned friend in view of the suggestion your Lordship has thrown out.

Mr. Justice Rowlatt: A fight to a finish in a profession is always a pity.

Mr. Hollis Walker: Yes, my Lord.

Mr. Justice Rowlatt: It is a pity for both sides. It would be a great pity for you if you lose, and I am not certain it would not be a pity for him if he wins.

Mr. Hollis Walker: It would certainly be a pity for him if he loses.

Mr. Justice Rowlatt: Mr. Young, I think you might speak to Mr. Walker about it.

Mr. Hugo Young: I will speak to my client about it, my Lord. I have not the remotest idea what my friend is prepared to do.

Mr. Justice Rowlatt: Speak to your client, and then speak to Mr. Walker yourself.

(The counsel and parties having conferred),

Mr. Hollis Walker: My Lord, we have to express our gratitude to your Lordship for the opportunity you have given us. I am glad to inform your Lordship that the time has not been entirely wasted, because the result of the negotiations which have taken place between my learned friend Mr. Young and myself has been that we have been able to bring the case to a conclusion. The record will be withdrawn upon certain terms. Those terms involve my making, if your Lordship will allow me to do so, a few remarks in connexion with this matter. What I wish to say is this. The real matters which formed the gist of the plaintiff's complaint here were the minutes of October, 1908, and June, 1912. My Lord, now that we have had the facts gone into and certain evidence has been adduced, two things have become obvious with regard to that minute of October, 1908: one is that it was irregularly passed, and the other is that it was unfortunately worded. The wording was such as certainly to justify, perhaps to require, those who read it to think that Dr. Sloman, in coming to Bedford and in embarking upon the practice which he was then carrying on in Bedford had been guilty of something in the nature of a trick. That was not the finding of the previous minutes of February and March, and I wish to state publicly as regards the defendants they desire to say that the word "ostensibly" and the imputation that it conveys never ought to have been put in that minute at all; that the truth is that which is contained in the earlier minute, which is that Dr. Sloman having come to Bedford and entered into negotiations with Dr. Clark, was justified in breaking off these negotiations. It follows from that, I venture to think, that we ought to expunge that minute of October, 1908, and if we ought to expunge that minute we ought to expunge that minute which was the corollary of that minute—namely, the one of June, 1912. Therefore, one of the terms of this settlement must be that those two minutes of October, 1908, and June, 1912, should be expunged, and that those who expunge them should express, and they do through me express, their regret that those minutes ever appeared in the minute book at all. I hope that is sufficient to deal with that matter. That is as regards the past. Now, as regards the future: it is clear that Dr. Sloman was given to understand, and did understand in the earlier stages of this controversy, that if he refrained from attending any of Dr. Clark's patients for three years he would be doing all that the local Branch of the Association required him to do. I have never suggested, and would not for a moment suggest, that Dr. Sloman had not loyally fulfilled that requirement, and, that, being so, we think it right that it should go forth publicly now that as the sequel to these proceedings to-day, Dr. Sloman is entitled to practise on a par with the other medical gentlemen in Bedford, and that he is entitled to be met in consultation by other medical gentlemen in Bedford or anywhere else without any restriction whatever. I venture to think that that should put an end to a good deal of the feeling which has been engendered in this case, and one cannot help expressing the hope that it will enable Dr. Sloman to practise here in Bedford on amicable terms with his colleagues in the town. There is just one other matter that I should mention, and that is this: Dr. Sloman having come here and brought this action, in the circumstances the defendants feel that he ought not to be out of pocket by this litigation. Further, in the letters which I read this morning, which I think show a not uncompromizing attitude on the part of the defendants, they said that if it were made apparent to them that reparation was desired it should be made to the plaintiff. The defendants will pay the plaintiff his taxed costs and a certain sum of money to compensate him for any inconvenience he may have been put to or any damage he may have suffered by reason of the course which events took in the years 1908 and 1912. There is, if I may say so, an item on the other side of the account, and that is that some hard things have been said, perhaps in the heat of advocacy, of the defendants and of the Association. Those gentlemen are also in practice in Bedford, and have their own reputations at stake. I understand my learned friend is prepared to say that, while he does not withdraw the suggestion that they have acted irregularly, unfortunately, or carelessly, there is no imputation against their conduct of the serious kind adumbrated this morning. With your Lordship's permission, the record will be withdrawn on terms.

Mr. Hugo Young: I am personally grateful to your Lordship for intervening in this matter, because, of course, your Lordship has put, in a very short space and very emphatically, exactly what was the crux of the case, and that has brought us to terms. My learned friend rather thought that I opened this case in a vindictive spirit. I do not desire to say one word that should give rise to any thought of that kind. If I may say so of my learned friend, I think he has very honourably carried out the suggestions as to the basis of this settlement in what he has stated to your Lordship. There is only one other thing that I have to mention with reference to what my learned friend is doing, and which I have full authority to refer to because it was understood that I should, although my friend himself had a little reluctance in mentioning it, and that is that, in addition to the costs, there is going to be paid to the plaintiff the sum of £500. There are just two things I have to mention—I hope in the same generous spirit that my learned friend has done. In the first place as regards Drs. Ross, Goldsmith, and Butters, who are made personal defendants as distinguished from the Association, and the suggestion of their having been actuated by personal malice and ill feeling towards the plaintiff: my Lord, it appears to me that there is what I may call a malice in law arising out of the circumstances in which the resolutions were passed which would be sufficient to justify me in asking the jury for damages. I desire to say now that I withdraw my suggestion of malice beyond what I may call legal malice arising out of the circumstances. I withdraw the suggestion that any one of those three gentlemen who were personally made defendants were actuated by any personal animosity or rivalry as against Dr. Sloman. There is one other thing that has been said in relation to the British Medical Association. I do not know whether it makes it better or worse, but it was not said in chief: it was said under the stress of cross-examination by my learned friend that the British Medical Association were not to be trusted fairly to hear and fairly to adjudicate upon a matter if it came before them, and Dr. Sloman did certainly say that he was not prepared to trust them. Now, I have Dr. Sloman's authority for saying that he desires to withdraw any such imputation against the Association, of which he had been a member for a number of years. There is not the slightest doubt that it is an association which does very good work in the medical profession. There is no doubt that it commands the respect of its members and a very large body of the public. It would not be right to close this case without saying that any such imputation on them is unreservedly withdrawn. I am glad this matter has come to this termination. Personally I feel, although the settlement is with my client's full consent, that it is really very much better for him as well as for the defendants that it should not have been fought to a finish. I hope your Lordship will think we have done wisely and well in settling this matter, because sometimes people are apt to think that counsel persuaded them to enter into a settlement. I think this is a case in which we should have your Lordship's full approval that what has been done is the proper thing to be done.

Mr. Justice Rowlatt: I absolutely agree with it. I think this is an absolutely right and just settlement from both points of view. I am sure no one can have arrived at the conclusion, from what has passed in this court, that these three gentlemen who are defendants were actuated by any unmanly spite against a fellow practitioner or anything of that sort. As Mr. Young had pointed out, he could frame this action without going to that length. I do not think any one would hold the opinion that they were guilty of anything so mean as that. But an irregularity was committed in the earlier stages, as Mr. Walker has frankly admitted. That has now clearly been brought out, and the resolution was unfortunately, probably unwittingly, without sufficient thought, worded in a way that necessarily causes damage to Dr. Sloman. Now that appearing to be the case, the British Medical Association have proved themselves big enough, strong enough, and just enough to come forward, and from a lofty standpoint to say: Here is a humble practitioner who has had this irregular and unfortunate resolution to contend with; he shall amply be set right. I think that to take that course would certainly not diminish the prestige of the Association which stands already so high, but would, on the contrary, add to it.

R. EHRMANN AND H. WOLFF (*Muench. med. Woch.*, September 23rd, 1913) have examined the blood serum of gouty patients chemically, utilizing some modifications of the usual methods, and in view of the results obtained draw certain deductions of which the following are the chief. The serums of normal persons at times contains uric acid in measurable quantities, even during the period when a purin-free diet is being taken, but the quantities under a purin-free diet may be no greater, and may even be less, than in normal subjects under the same diet. The uric acid content of the serum of gouty patients (in contradistinction to the whole blood) is greater than the purin body content. The concentration of hydrogen ions in the blood of gouty subjects is at times higher than that of normal or diabetic (comatose) patients, and this confirms the statement that the alkalinity of blood decreases in gout.

Medical News.

THE Earl of Derby has become president of the twenty-ninth congress of the Royal Sanitary Institute to be held at Blackpool on July 6th to 11th, 1914.

The Legislative Council of Nigeria has voted £400 in response to Mr. Austen Chamberlain's appeal for £100,000 for the endowment of the London School of Tropical Medicine.

SURGEON GENERAL SIR R. HAVELOCK CHARLES, G.C.V.O., will, on October 29th, at 4 p.m., present the prizes at the Royal Army Medical College, Grosvenor Road, S.W., on the conclusion of the 106th session.

THE annual meeting of the Society for Training Teachers of the Deaf and for the Diffusion of the German (Pure Oral) System will be held at 33, Cavendish Square, W., on Wednesday next, at 3.30 p.m.

WE are asked to state that the public are invited to hear the address which, as announced last week, is to be given by Sir Gilbert Parker, M.P., at the West London Hospital Post-graduate College on Thursday next at 5 p.m.; tea and coffee will be served at 4.15.

THE National Association for the Prevention of Infant Mortality and for the Welfare of Infancy has arranged a second post-graduate course on the feeding and care of infants to be held from January 12th to 22nd, 1914. Further particulars can be obtained on application to the Secretary, 4, Tavistock Square, W.C.

THE council of the Royal Meteorological Society has awarded the Symons Gold Medal to Mr. W. H. Dines, F.R.S., in recognition of the valuable work which he has done in connexion with meteorological science. The medal will be presented at the annual meeting of the Society on January 21st, 1914.

THE fifth Norman Kerr Memorial Lecture will be delivered before the Society for the Study of Inebriety, by Sir Thomas S. Clouston, M.D., LL.D., on Monday, November 3rd, 1913, at 4 p.m., in the Hall of the Royal College of Physicians, Queen Street, Edinburgh. The subject is "The Clinical Aspects of the Study of Inebriety."

STEPS are being taken at Haslemere to raise an adequate fund for the permanent endowment of the educational museum established in the town by the late Sir Jonathan Hutchinson. The trustees under his will have expressed their readiness to maintain the museum for another year, and at the end of that period to hand over the freehold site, the museum, and its contents to a trust committee.

THE Medical Committee of the Royal Dental Hospital of London will be "at home" to all old students from 2.30 p.m. to 5 p.m. on Saturday, November 22nd. The various departments of the hospital and school will be open and specimens and cases of interest shown. The annual dinner will take place the same evening at the Hotel Metropole, Mr. Rees Price in the chair. Past and present students who desire to obtain tickets should communicate with the dean at the hospital in Leicester Square, W.C.

DUFF HOUSE, near Banff, formerly the residence of the late Duke of Fife, has been opened as an institution for the treatment of disorders of metabolism. The patients will be under the direction of the physicians in respect of diet, exercises, baths, etc. The senior physician is Dr. E. I. Spriggs, formerly assistant physician to St. George's Hospital, and the junior physician is Dr. R. Gompertz, formerly surgical registrar, King's College. The institution is provided with a laboratory and has the services of an analytical chemist and a consulting bacteriologist.

ON Saturday, November 1st, collections will be made throughout London on behalf of the Mothers' Day Fund, and on the following day the Lord Mayor, who has consented to receive donations to the fund at the Mansion House, will attend in State a service at St. Paul's Cathedral. The object of the fund is to extend the work already being done by various societies with the object of reducing infant mortality and promoting the well-being of surviving children. The methods employed are partly educational, partly nutritional, well-cooked dinners being served daily to expectant or nursing mothers at the cost of 1d. or 2d. a meal, or gratis if the mothers are exceptionally poor. It is hoped that the present endeavour, one thoroughly meriting support, will make it possible to continue to maintain the present mothers' dining rooms and to start others in boroughs where they do not at present exist. The arrangements are in charge of the Women's League of Service, 31A, Mortimer Street. The honorary secretaries of this league are both medical women—namely, Dr. Florence Willey and Dr. Barbara Tchaykovsky.

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

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TELEGRAPHIC ADDRESS.—The telegraphic address of the EDITOR of the BRITISH MEDICAL JOURNAL is *Aitiology, Westrand, London.* The telegraphic address of the BRITISH MEDICAL JOURNAL is *Articulate, Westrand, London.*

TELEPHONE (National):—
2631, Gerrard, EDITOR, BRITISH MEDICAL JOURNAL.
2630, Gerrard, BRITISH MEDICAL ASSOCIATION.
2634, Gerrard, MEDICAL SECRETARY.

☞ *Queries, answers, and communications relating to subjects to which special departments of the* BRITISH MEDICAL JOURNAL *are devoted will be found under their respective headings.*

QUERIES.

RINGWORM asks if any ill effects, more particularly on the eyes, have been noticed from the glare of a Lodge tube, used in an *x*-ray apparatus for ringworm, for reverse current.

LETTERS, NOTES, ETC.

HERPES AND VARICELLA.

DR. JAMES BUSFIELD (Enfield) writes: In further support of the alleged connexion between shingles and chicken-pox (of which I must admit to having been somewhat sceptical) I should like to report the following: I attend a family with five grown-up daughters. The first, second, and third had chicken-pox when the third was an infant. On September 15th the second began with a typical attack of shingles; on October 2nd, seventeen days later, the fourth developed chicken-pox, and no other source of infection could be traced. The fifth was away from home until September 24th, and up to the present has remained well.

SHIP SURGEONS.

MARINE writes: If ship surgeons would follow the advice of "B.A., M.B." they have the matter of remuneration in their own hands. Salaries of £20 or even £25 a month are being given by the leading steamship lines if doctors stick out for it. Otherwise they only get £10 and poor accommodation. But other members of the profession should help. It is said that doctors taking a holiday cruise on tourist vessels go for their passage money, signing on for 1s. a month and providing their uniform. This is hardly fair to their colleagues; a little consideration on their part would end in all getting adequate recompense for their skill and time. Let me urge no one to accept less than £20 to £25 a month. Ship surgeons must be had and the matter is simply one of withholding our services until the payment is on a fair basis. I would also advocate the fee system being insisted on. No one, unless he has experienced it, can imagine the thousand and one trivial things a ship's surgeon is called on to do by passengers where his services are free.

TREATMENT OF CHRONIC ULCER OF THE LEG.

DR. G. ARBOUR STEPHENS (Swansea) writes: Dr. Winkelried Williams's kindly reference in his paper on the treatment of chronic ulcer of the leg to the introduction of calcium iodide by me deserves, I think, a little amplification. It is, on his own showing, the most supported treatment of all those mentioned; for, in addition to three named supporters, he adds, "and others," whilst there is also mentioned one anonymous authority who found it of no use in his one and only case. "J. D.'s" hypersensitive stomach, in view of the extensive use at the present day of calcium iodide, must be quite a curiosity. I am sorry Dr. Williams did not give it a trial worthy of the name, when he might have found the drug, especially combined with subcutaneous injections of distilled water as recommended in the BRITISH MEDICAL JOURNAL of April 5th, the best treatment of all.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

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